



United States Department of the Interior

BUREAU OF LAND MANAGEMENT

COOS BAY DISTRICT OFFICE

1300 AIRPORT LANE, NORTH BEND, OR 97459

Web Address: <http://www.blm.gov/or/districts/coosbay> E-mail: OR_CoosBay_Mail@blm.gov

Telephone: (541) 756-0100 Toll Free: (888) 809-0839 Fax: (541) 751-4303



1792(OR-120)
EA OR128-07-01
Slater Rocks

May 16, 2008

Dear Citizen:

Enclosed is a copy of the "Slater Rocks Environmental Assessment" (EA OR128-07-01) and finding of no significant impact (FONSI) for proposed commercial thinning and density management harvest projects. These projects are designed to implement management objectives described in the BLM Coos Bay District Resource Management Plan and Northwest Forest Plan. The environmental assessment analyzes a no-action alternative and a proposed-action alternative.

The Myrtlewood Field Office proposes to thin 30-70 year old forest stands consisting primarily of conifer plantations. The project would thin approximately 1400 acres of conifer stands. Management actions would occur within the Matrix and Riparian Reserve land-use allocations in the following sub-watersheds or drainages listed in Table 1.

Table: 1 Project Area Location by Sub-watershed or Drainage

Watershed (5th field)	Sub-watershed (6th field)	Acres	Treatment Acres
Middle Fork Coquille River	Upper Rock Creek	18,340	552
	Slater Creek	21,510	675
	Drainage (7th field)		
	Bingham Creek	10,960	125
	Upper Twelve Mile Creek	6,680	30
Totals		57,490	1382

The legal descriptions for the proposed project are depicted in the following table:

Table 2: Legal Description for all Units

Township	Range	Sections
29 S.	9 W.	9, 21, 29, 31, 33
29 S.	10 W.	35
30 S.	9 W.	5, 7, 17, 21, 33
30 S.	10 W.	9, 15

You are encouraged to read the EA and comment on the appropriateness of the FONSI prior to the end of the 30-day comment period, June 16, 2008. The harvests could be accomplished by multiple timber sale contracts in FY 2008 to FY2010. A Decision Document will be published prior to the sale of timber.

Comments, including names and street addresses of respondents, will be available for public review at the address above during regular business hours (8:00 a.m. to 4:30 p.m.), Monday through Friday, except holidays, and may be published as part of the EA document or other related documents. Individual respondents may request confidentiality. If you wish to withhold

your name or street address from public review or from disclosure under Freedom of Information Act, you must state this prominently at the beginning of your written comment. Such requests will be honored to the extent allowed by law. All submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, will be made available for public inspection in their entirety.

Questions should be directed to Aimee Hoefs at (541) 751-4498.

Written comments on the EA and appropriateness of the FONSI may be sent to:
BLM Coos Bay District
Attn: Aimee Hoefs
1300 Airport Lane
North Bend, OR 97459-2000

You may e-mail your comments to:
OR_CoosBay_Mail@blm.gov, RE: Slater Rocks EA OR128-07-01, Aimee Hoefs

Sincerely,

Paul T. Flanagan

Paul T. Flanagan
Myrtlewood Field Manager

Attachments:

- (1) Slater Rocks EA OR128-07-01 FONSI (4 pp)
- (2) Slater Rocks EA OR128-07-01 (113 pp)



United States Department of the Interior

BUREAU OF LAND MANAGEMENT

COOS BAY DISTRICT OFFICE

1300 AIRPORT LANE, NORTH BEND, OR 97459

Web Address: <http://www.blm.gov/or/districts/coosbay> E-mail: OR_CoosBay_Mail@blm.gov

Telephone: (541) 756-0100 Toll Free: (888) 809-0839 Fax: (541) 751-4303



May 16, 2008

Reply to: 1792(OR-120)

EA-OR-128-07-01

FINDING OF NO SIGNIFICANT IMPACT (FONSI)

For the

Slater Rocks Environmental Assessment

EA-OR-128-07-01

I. Introduction

An Interdisciplinary Team has prepared an Environmental Assessment (EA) for the Slater Rocks Project located within the Myrtlewood Field Office of the Coos Bay District Bureau of Land Management. This EA is hereby incorporated by reference. Within this document, the team analyzed two alternatives: a no-action alternative (Alternative 1) and a proposed action alternative (Alternative 2). Alternative 1 would not conduct forest management activities on these lands at this time. Alternative 2 proposes to manage tree densities on approximately 1400 acres, create snags and downed wood, construct 4.1 miles of new road, renovate or improve 14.8 miles of road, and decommission 10.7 total miles of road. The locations for the project area/units are described in Table 1. Stand treatments would occur in the Matrix and Riparian Reserve land-use allocations.

Table 1: Legal Description for all Units

Township	Range	Sections
29 S.	9 W.	9, 21, 29, 31, 33
29 S.	10 W.	35
30 S.	9 W.	5, 7, 17, 21, 33
30 S.	10 W.	9, 15

II. Background

The Coos Bay District (CBD) of the Bureau of Land Management (BLM) is under the direction of the Final Coos Bay District Proposed Resource Management Plan Final Environmental Impact Statement (USDI-BLM 1994) and it's Record of Decision (USDI-BLM 1995), and the Final Supplemental Environmental Impact Statement on Management of Habitat for Late Successional and Old Growth Forest Related Species Within the Range of the Northern Spotted Owl (FSEIS), commonly referred to as the "Northwest Forest Plan" [NFP] (USDA-FS; USDI-BLM 1994a) and its Record of Decision (USDA-FS; USDI-BLM 1994b) as supplemented and amended by:

Management of Port-Orford-cedar in Southwest Oregon Final Supplemental Environmental Impact Statement (USDA and USDI 2004), and its Record of Decision (USDI 2004).

The Final Supplement to The 2004 Environmental Impact Statement to Remove or Modify The Survey and Manage Mitigation Measure Standards and Guidelines (USDA and USDI BLM 2007) and its *Record of Decision* (USDI 2007).

This EA is also tiered to and in conformance with the *Final Programmatic Environmental Impact Statement Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States* (USDI 2007b) and its *Record of Decision* (USDI 2007c).

As stated in the ROD for the NFP, the Aquatic Conservation Strategy (ACS) was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems on public lands within the range of Pacific Ocean anadromy. Consistency of the proposed alternative with the ACS Objectives is included in Chapter 3 of the Slater Rocks EA.

III. Finding of No Significant Impact

A careful review of the EA, which I herein adopt, indicates that there would not be a significant impact on the quality of the human environment from the implementation of any of the alternatives. This finding and conclusion is based on my consideration of the Council of Environmental Quality's (CEQ) criteria for significance (40 CFR 1508.27), both with regard to the context and intensity of the impacts described in the EA.

Context

The proposed activities are not national or regional in scope. The Slater Rocks EA comprises 1,382 project acres. Table 2 summarizes the project area/units by the two main sub-watersheds and the two additional smaller drainages.

Table 2: Project acres by applicable Sub-watershed or Drainage

Watershed (5th field)	Sub-watershed (6th field)	Acres	Treatment Acres	Percent of Sub-watershed/ Drainage
Middle Fork Coquille River	Upper Rock Creek	18,340	552	3.0
	Slater Creek	21,510	675	3.1
	Drainage (7th field)			
	Bingham Creek	10,960	125	1.1
	Upper Twelve Mile Creek	6,680	30	0.4
Totals		57,490	1382	2.4

Intensity

Impacts that may be both beneficial and adverse (40 CFR 1508.27(b)(1))

Any impacts, both beneficial and adverse, are not significant as they are consistent with the range and scope of those effects analyzed and described in the Coos Bay District Final Proposed Resource Management Plan/Environmental Impact Statement.

Public Health and Safety (40 CFR 1508.27(b)(2))

The proposed activities would not significantly affect public health and safety. Adherence to the Oregon Smoke Management Plan (OAR 629-43-043) and the State of Oregon Administrative Rule No. 340-108, *Oil and Hazardous Materials Spills and Releases*, would minimize impacts to Air Quality and from Solid/Hazardous Wastes.

Unique characteristics of the geographic area (40 CFR 1508.27(b)(3))

The proposed activities will have no impact on unique characteristics of the geographic area such as historic or cultural resources, park lands, prime or unique farmlands, wetlands or floodplains, Wild and Scenic Rivers, wilderness, or ecologically significant or critical areas.

Degree to which effects are likely to be highly controversial (40 CFR 1508.27(b)(4))

The effects on the quality of the human environment of the proposed activities are not highly controversial. Three comments were received in response to Scoping for this project (March 21 – April 19, 2007). Comments focused on project design and implementation. No comments were received that I consider highly controversial.

Degree to which effects are highly uncertain or involve unique or unknown risks (40 CFR 1508.27(b)(5))

The possible effects of the proposed activities on the quality of the human environment are not highly uncertain and do not involve unique or unknown risk.

Consideration of whether the action may establish a precedent for future actions with significant impacts (40 CFR 1508.27(b)(6))

The proposed projects do not establish a precedent for future actions or represent a decision in principle about future actions with potentially significant effects.

Consideration of whether the action is related to other actions with cumulatively significant impacts (40 CFR 1508.27(b)(7))

There are no significant cumulative effects identified by this assessment. Although there would be removal of vegetation within the Riparian Reserves and potentially ground-disturbing activities, potential adverse impacts to the aquatic environment (including water quality) are eliminated or substantially avoided through the implementation of project design features such as no-harvest buffers.

Scientific, cultural, or historical resources, including those listed in or eligible for listing in the National Register of Historic Places (40 CFR 1508.27(b)(8))

The proposed activities would not affect districts, sites, highways, structures or objects listed in or potentially eligible for listing in the National Register of Historic Places. Nor would the activities cause a loss or destruction of significant scientific, cultural, or historical resources.

Threatened or endangered species and their critical habitat (40 CFR 1508.27(b)(9))

- The Myrtlewood Field Office is in the process of consulting on the effects of noise disturbance on marbled murrelets and northern spotted owls with the U.S. Fish and Wildlife Service in accordance with Section 7(A)(4) of the Act. A Biological Opinion is anticipated and applicable Terms and Conditions would be implemented. The results of this consultation would be disclosed in the decision records for the Mister Slate Commercial Thinning (CT), Rock Bottom CT, Rocky Top CT, Pink Panther CT, Busy Signal CT, and Heavy Bone CT

- As the proposed action has been determined to have “no effect” to federally threatened Oregon Coast coho salmon and its associated Critical Habitat, there is no requirement to conduct consultation with the National Marine Fisheries Service.
- The proposed action would also not result in adverse effects to Essential Fish Habitat as designated by the Magnuson-Stevens Fishery Conservation and Management Act (MSA; 16 U.S.C. 1855 as amended).

Any effects that threaten a violation of Federal, State, or local laws or requirements imposed for the protection of the environment (40 CFR 1508.27(b)(10))

The proposed activities would not violate Federal, State, or local laws imposed for the protection of the environment. These include the Clean Air Act and the Clean Water Act.

Analysis has also concluded that implementation of the proposed actions would not contribute to the need to list any Special Status Species as identified in BLM Manual 6840 and BLM OR/WA 6840 policy.

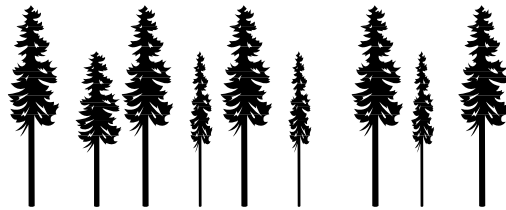
Pursuant to Executive Order 13212, the BLM must consider the effects of this decision on the President’s National Energy Policy. As there would be no impact to the exploration, development, or transportation of undeveloped energy sources from the proposed action, a Statement of Adverse Energy Impacts is not required.

Based on the analysis of potential impacts contained in the Slater Rocks environmental assessment, I have determined that the proposed action would not have a significant impact on the human environment within the meaning of section 102(2) (c) of the National Environmental Policy Act of 1969, and that an Environmental Impact Statement is not required. I have determined that the effects of the proposed silvicultural treatments and associated road management activities are within those anticipated and already analyzed in the *Final Coos Bay District Proposed Resource Management Plan/Environmental Impact Statement* and would be in conformance with the *Record of Decision/Resource Management Plan* for the Coos Bay District.

Paul T. Flanagan
Paul T. Flanagan
Myrtlewood Field Manager

May 16, 2008
Date

Slater Rocks



ENVIRONMENTAL ASSESSMENT

EA: OR128-07-01

**Myrtlewood Field Office
Coos Bay District
Bureau of Land Management**

May 12, 2008

TABLE OF CONTENTS

TABLE OF CONTENTS	2
TABLE OF TABLES	3
CHAPTER I. PURPOSE OF AND NEED FOR ACTION	4
1.1 PROPOSED ACTION: SLATER ROCKS.....	4
1.1.1 LOCATION	4
1.2 CONFORMANCE WITH EXISTING LAND USE PLANS.....	4
1.2.1 ENDANGERED SPECIES ACT	5
1.3 PURPOSE AND NEED	5
1.3.1 NEED FOR THE PROJECT	5
1.3.2 PURPOSE (OBJECTIVES) OF THE PROJECT	7
1.3.3 DECISION FACTORS	8
1.4 DECISIONS TO BE MADE.....	8
1.5 PUBLIC INVOLVEMENT	9
1.5.1 POTENTIAL ISSUES	9
1.5.2 IDENTIFIED CONCERNS.....	9
CHAPTER II. ALTERNATIVES.....	13
2.1 NO ACTION ALTERNATIVE.....	13
2.2 PROPOSED ACTION ALTERNATIVE.....	13
2.3 SILVICULTURAL TREATMENTS.....	17
2.3.1 VARIABLE DENSITY THINNING	17
2.3.2 COMMERCIAL THINNING PRESCRIPTION	18
2.3.3 DENSITY MANAGEMENT THINNING PRESCRIPTION WITH GAPS	19
2.3.4 STAND STRUCTURE	21
2.4 ROAD MANAGEMENT.....	21
2.4.1 NEW ROAD CONSTRUCTION.....	22
2.4.2 ROAD RENOVATION/IMPROVEMENT	23
2.4.3 ROAD DECOMMISSIONING.....	23
2.4.4 HAUL ROUTE MAINTENANCE.....	23
2.5 DESIGN FEATURES FOR THE PROPOSED ACTION	24
2.5.1 HARVEST OPERATIONS	24
2.5.2 ROAD CONSTRUCTION	26
2.5.3 FISHERIES/AQUATIC RESOURCES	29
2.5.4 SPECIAL STATUS SPECIES-INCLUDING T & E SPECIES.....	29
2.5.5 NOXIOUS WEEDS	29
2.5.6 PORT-ORFORD CEDAR.....	29
2.5.7 CULTURAL RESOURCES.....	30
CHAPTER III. AFFECTED ENVIRONMENT AND CHAPTER VI. ENVIRONMENTAL CONSEQUENCES	31
3.1 ANALYSIS BACKGROUND	31
3.1.1 REASONABLY FORESEEABLE ACTIONS	31

3.1.2	OTHER ACTIONS	32
3.1.3	CUMULATIVE EFFECTS CONSIDERATIONS	32
3.2	RESOURCES	33
3.2.1	STAND CONDITION	33
3.2.2	WILDLIFE	44
3.2.3	WATER RESOURCES	53
3.2.4	AQUATIC HABITAT	59
3.2.5	BOTANICALS	65
3.2.6	FOREST FUELS AND FIRE	68
3.2.7	CONSISTENCY WITH THE AQUATIC CONSERVATION STRATEGY	69
3.3	AFFECTED RESOURCES NOT ANALYZED IN DETAIL	80
3.4	UNAFFECTED RESOURCES	82
CHAPTER IV.	LITERATURE CITED.....	83
CHAPTER V.	LIST OF PREPARERS	89
CHAPTER VI.	LIST OF AGENCIES AND PERSONS CONTACTED	89
APPENDIX A:	ROAD WORK.....	90
APPENDIX B:	BOTANY	93
APPENDIX C:	NOXIOUS WEED RISK ASSESSMENT	96

<h2 style="text-align: center;">TABLE OF TABLES</h2>
--

TABLE II-1: PROJECT AREA ACRES* AND LOCATIONS FOR EACH PROPOSED SALE.....	14
TABLE II-2: YARDING SYSTEMS BY UNITS	14
TABLE II-3: PROPOSED ACTION SUMMARY	16
TABLE II-4: COMPARISON OF STAND DATA PRE- AND POST- THINNING USING THE SPS GROWTH MODEL	20
TABLE II-5: SNAG AND/OR DOWN WOOD (DW) CREATION BY UNITS WHERE APPLICABLE.....	21
TABLE II-6: BLM PROPOSAL - LEAST AMOUNT OF ROCKED ROADS.....	22
TABLE II-7: MOST ROCKED ROADS TO FACILITATE MORE WINTER ACTIVITIES	22
TABLE II-8: ROUTINE MAINTENANCE	24
TABLE II-9: GUIDE FOR DRAINAGE SPACING BY SOIL EROSION CLASSES AND ROAD GRADE.....	27
TABLE III-1: SUMMARY OF CURRENT STAND CONDITIONS	33
TABLE III-2: DISTRIBUTION OF PLOT LEVEL (PATCH) RELATIVE DENSITY	34
TABLE III-3: RELATIVE DENSITY FOR DOUGLAS-FIR AND WESTERN HEMLOCK	36
TABLE III-4: COMPARISON OF PRE AND POST THINNING PERCENT OF PLOTS (PATCHES) BY RELATIVE DENSITY RANGE IN TYPICAL THINNING TREATMENTS ON THE COOS BAY DISTRICT.	38
TABLE III-5: SNAG DENSITIES IN PORTIONS OF STANDS INCLUDING PROPOSED UNITS.	40
TABLE III-6: DOWN WOOD LEVELS IN PROPOSED SLATER ROCKS THINNING UNITS.....	41
TABLE III-7: SNAG AND DOWN WOOD CREATION PARAMETERS FOR PROPOSED UNITS.	43
TABLE III-8: SUMMARY OF MURRELET HABITATS WITHIN THE PROJECT AREA	45
TABLE III-9: SUMMARY OF NSO HABITATS WITHIN THE PROJECT AREA	47
TABLE III-10: HYDROLOGIC ANALYSIS AREA BY SUB-WATERSHED OR DRAINAGE	54
TABLE III-11: BUREAU SENSITIVE SPECIES NOT PRESENT IN THE ANALYSIS AREA.....	60
TABLE A-1: NEW ROAD CONSTRUCTION	90
TABLE A-2: ROAD RENOVATION AND IMPROVEMENT.....	91
TABLE B-1: VASCULAR PLANTS WITHIN THE PROJECT AREA THAT ARE SUSPECTED TO OCCUR, ARE BUREAU SENSITIVE, AND SURVEYS ARE PRACTICAL TO COMPLETE.....	93
TABLE B-2: NON-VASCULAR PLANTS WITHIN THE PROJECT AREA THAT ARE SUSPECTED TO OCCUR, ARE BUREAU SENSITIVE, AND SURVEYS ARE PRACTICAL TO COMPLETE.....	94
TABLE B-3: FUNGI SPECIES LIKELY IN PROJECT AREA, BUT NOT PRACTICAL TO SURVEY.....	95

CHAPTER I. PURPOSE OF AND NEED FOR ACTION

1.1 PROPOSED ACTION: SLATER ROCKS

The Myrtlewood Field Office proposes to treat 30 to 70 year-old stands of primarily Douglas-fir and western hemlock within the Matrix land-use allocation (LUA) by commercial thinning (CT) and within the Riparian Reserve LUA by density management thinning (DMT). The 1400 acres of treatment would remove suppressed, intermediate, and some of the co-dominant trees competing with each other for growing space (thinning from below). Some of the Matrix stands proposed for a thinning are interspersed with red alder; these areas would be thinned to reduce competition and enhance growth. Where feasible, areas dominated by red alder have been excluded from proposed harvest units when found along exterior portions of stands and adjacent to streams. Riparian Reserves would have gap creation prescriptions and would protect alder to the extent possible.

The project would be funded by the sale of timber removed from the stands in multiple harvests tentatively planned for 2008-2010.

This Environmental Assessment (EA) has been prepared to determine if any significant environmental effects of the proposal are substantially greater than what has already been analyzed in the existing Resource Management Plan's programmatic Environmental Impact Statement (EIS).

1.1.1 Location

The proposed treatment area of roughly 1400 acres is located approximately 25 miles inland from the Pacific Coast, near Bridge Or., and is bisected by State Highway 42. Most of the proposed units are located in the Slater Creek and Rock Creek sub-watersheds. A few units are located in the Bingham Creek 7th Field of the Camas Valley sub-watershed, and the Upper Twelve Mile Creek 7th Field of the Twelve Mile sub-watershed.

1.2 CONFORMANCE WITH EXISTING LAND USE PLANS

This EA is tiered to and in conformance with the *Coos Bay District Resource Management Plan/Final Environmental Impact Statement* (USDI 1994) and its *Record of Decision* (USDI 1995) and the *Final Supplemental Environmental Impact Statement (FSEIS) on Management of Habitat for Late Successional and Old Growth Forest Related Species Within the Range of the Northern Spotted Owl (Northwest Forest Plan [NFP])* (USDA and USDI 1994a) and its *Record of Decision* (USDA and USDI 1994b) as supplemented and amended by:

- *Management of Port-Orford-cedar in Southwest Oregon Final Supplemental Environmental Impact Statement* (USDA and USDI 2004). and its *Record of Decision* (USDI 2004).
- *The Final Supplement to The 2004 Environmental Impact Statement to Remove or Modify The Survey and Manage Mitigation Measure Standards*

and Guidelines (USDA and USDI 2007) and its *Record of Decision* (USDI 2007c).

This EA is also tiered to and in conformance with the *Final Programmatic Environmental Impact Statement Vegetation Treatments Using Herbicides On Bureau Of Land Management Lands in 17 Western States* (USDI 2007d) and its *Record of Decision* (USDI 2007e) as well as the *Coos Bay Integrated Noxious Weed Program* (EA OR 120-97-11).

All of these documents are available for review at the Coos Bay District Office of the Bureau of Land Management, during regular business hours. Some of the documents are available at the Coos Bay and North Bend Public Libraries, the Coos Bay District's Internet Home Page at <http://www.or.blm.gov/coosbay>, and the Oregon State Office of the Bureau of Land Management in Portland, Oregon.

1.2.1 Endangered Species Act

Consultation with the U.S. Fish and Wildlife Service (USFWS) as provided in Section 7 of the Endangered Species Act (ESA) of 1973 (16 U.S.C. 1536 (a)(2) and (a)(4) as amended) is currently in process and a project level Biological Assessment (BA C08-01) will be submitted for activities causing noise disturbance to northern spotted owls and marbled murrelets during nesting periods. It is anticipated that a Biological Opinion will be returned. All of the appropriate Terms and Conditions will be incorporated.

Consultation with the National Marine Fisheries Service will not be requested as the proposed project has been determined to have “*no effect*” to threatened Oregon Coast coho salmon. Additionally, project activities would not adversely effect Essential Fish Habitat under the Magnuson-Steven Fishery Conservation and Management Act (16 U.S.C. 1855(b)).

1.3 PURPOSE AND NEED

1.3.1 Need for the Project

The *Final - Coos Bay District Resource Management Plan and Environmental Impact Statement* (RMP) and its *Record of Decision* (ROD) (1995) responds to two needs: the need for forest habitat and the need for forest products. These needs were addressed in the RMP through an ecosystem management strategy under which BLM lands “will be managed to maintain healthy, functioning ecosystems from which a sustainable production of natural resources can be provided.” The proposed action, as described in this Environmental Assessment, is to implement the Coos Bay District's RMP in the Slater Rocks project area. The proposed project would improve stand health, provide a commercial product to support local communities, and restore desired forest habitats within the Riparian Reserve land-use allocation. Other than the “no action” alternative, in order for an alternative to be seriously considered, it must be designed to satisfy the needs described below.

The Coos Bay District declared in the RMP an Allowable Sale Quantity (ASQ) of 27 MMbf per year, which is to be harvested entirely from the Matrix land-use allocation. The Matrix

LUA consists of two sub-sets, General Forest Management Area (GFMA) and Connectivity/Diversity Blocks. The Slater Rocks stands are a combination of GFMA and Riparian Reserves, from which timber volume does not contribute to the ASQ.

These GFMA stands are characterized by uniform structure, heavy stocking, slowing growth rate, and low stand vigor. Research indicates that stands that develop at very high densities are susceptible to diameter growth stagnation and instability (Wilson and Oliver 2000). Without treatment at the appropriate time, these dense stands rapidly decline in growth and vigor. This results in a stagnant stand that becomes more susceptible to wind, insects, disease, and fire disturbances.

Riparian Reserve (RR) stands in this project are in the same over-stocked condition. Left untreated, these stands would not achieve the desired vegetation characteristics envisioned in the Aquatic Conservation Strategy in the Northwest Forest Plan (USDA and USDI 1994a). Reducing stand density is required in order to maintain a growth trajectory, improve stand stability, and meet the Riparian Reserve objectives.

The Middle Fork Coquille Watershed contains approximately 16,000 acres in the 30-70 year old age class that may require thinning. Commercial thinning should be conducted when the stands are old enough to produce a commercially viable product, or the response to thinning is substantial enough to warrant the action.

The proposal is to treat approximately 1400 acres of stands from 30 to 70 years of age within the Slater Rocks project area. There are approximately 936 acres identified as GFMA within this proposal. Commercial thinning treatment of these stands would provide an immediate supply of timber to the local economy. Such treatments would achieve the RMP objectives in the project area. The timber proposed for harvest within the Matrix are on lands allocated to the primary purpose of timber production (GFMA) and are of the age and condition anticipated for commercial thinning under the RMP. The sale of the removed timber would accomplish the need for commercial products as required under the O&C act.

Density Management Thinning would occur within associated Riparian Reserves. Approximately 447 acres have been identified for DMT within the Slater Rocks project area. Stand prescriptions would be the same as for commercial thinning units with the addition of gap creation. Alder would also be retained at higher levels.

Some of the heavily stocked acres in the analysis area could not be treated at this time due to one or a combination of constraints: lack of existing roads, difficult or expensive road work, arrangement of streams, stand slope position, or stand characteristics.

Efficient road access is necessary to carry out forest management activities which include the proposed action. The road network in the analysis area is a mixture of private and BLM roads built for forest management activities. The constraints imposed on harvest design in commercial thinning require that new roads be built to access portions of the stands. Additionally, some roads on BLM lands have been assigned a lower maintenance level and are currently overgrown with vegetation. Therefore, road management activities under the

proposed action would include new construction, road renovation and improvement, and decommissioning.

1.3.2 Purpose (Objectives) of the Project

A reasonable action alternative must meet the objectives provided in the ROD/RMP for projects to be implemented in the planning area. The ROD/RMP and applicable statutes specify the following objectives to be accomplished in managing the lands in the project area:

1. Provide a sustainable supply of timber and other forest commodities to provide jobs and contribute to community stability (p.22) by:
 - Conducting timber harvest and other silvicultural activities in that portion of the Matrix with suitable forest lands (p.22).
 - Selecting logging systems based on the suitability and economic efficiency of each system for the successful implementation of the silvicultural prescription, for protection of soil and water quality, and for meeting other land use objectives (p.52).
 - Providing timber sale volume toward the Coos Bay District Allowable Sale Quantity as required in the Oregon and California Act (O&C Act) of August 28, 1937. The BLM has a statutory obligation under the O&C Act to manage suitable commercial forest lands revested by the government from the Oregon and California Railroad grant (O&C lands) for permanent forest production in accordance with the sustained yield principle.
2. Manage developing stands on available lands to promote tree survival and growth and to achieve a balance between wood volume production, quality of wood, and timber value at harvest (p.52) by:
 - Applying silvicultural systems that are planned to produce, over time, forests with desired species composition, structural characteristics, and distribution of seral or age classes (p.53).
 - Basing silvicultural treatments and harvest designs on the functional characteristics of the ecosystem and the characteristics of each forest stand site. Treatments would be designed – as much as possible – to prevent the development of undesirable stand characteristics (p.53).
3. Manage the riparian-dependent resources to maintain the existing condition or implement actions to restore conditions by:
 - Applying silvicultural practices for Riparian Reserves to control stocking, re-establish and manage stands, and acquire desired vegetation characteristics (p.13).
4. Protect, manage, and conserve federally listed and proposed species and their habitats to achieve their recovery in compliance with the Endangered Species Act, approved recovery plans, and the Bureau Special Status Species Program (p.32) by:

- Providing for important ecological functions such as dispersal of organisms, carryover of some species from one stand to the next, and maintenance of ecologically valuable structural components such as down logs, snags, and large trees (p.22)

1.3.3 Decision Factors

In choosing the alternative that best meets the purpose and need, consideration would be given to the extent to which each alternative would:

1. Reduce competition-based mortality and increase tree vigor and growth specific to the Matrix;
2. Improve Riparian Reserve stand structure by thinning out excess trees in overstocked stands to enhance the growth and vigor of the residual trees while retaining structural and habitat components, such as large trees, snags, and coarse wood;
3. Provide timber resources and revenue to the government from the sale of those resources;
4. Provide cost effective management that would enable implementation of these management objectives while providing collateral economic benefits to society;
5. Implement goals of the Western Oregon Districts Transportation Management Plan (TMP) by renovating or improving roads and decommissioning roads not needed for continued resource management;
6. Comply with applicable laws and Bureau policies including, but not limited to: the Clean Water Act, the Endangered Species Act, the O&C Act, The Magnuson-Stevens Fishery Conservation and Management Act, and the Special Status Species Program.

1.4 DECISIONS TO BE MADE

The Field Manager of the Myrtlewood Field Office, Coos Bay BLM, must decide whether to conduct commercial and density management thinning within the Slater Rocks project area. This project is described in detail starting in Section 2.2.

The Field Manager must also determine if the selected alternative would or would not be a major Federal action significantly affecting the quality of the human environment. If the Manager decides it **would not** significantly affect the quality of the human environment, then the Manager can prepare and sign a FONSI (Finding of No Significant Impact).

If the Manager determines that the selected alternative would significantly affect the quality of the human environment, then the project must either be dropped, modified, or have an EIS (Environmental Impact Statement) and a ROD (Record of Decision) prepared and signed before the Slater Rocks project could proceed.

1.5 PUBLIC INVOLVEMENT

The primary purpose of scoping is to identify agency and public concerns relating to a proposed project and helps define the environmental impacts of concern to be examined in detail in the EA. The initial scoping process consisted of an ID Team that identified potential issues that may result in the development of additional alternatives. The general public was notified of the proposed project and EA through publication of the District's semi-annual Planning Update. Additional scoping notices were also sent to adjacent landowners, agencies that have requested these documents, and other interested parties on the District NEPA mailing list. The scoping period for the proposed project ran between March 21, 2007, and April 19, 2007.

1.5.1 Potential Issues

The ID Team reviewed scoping comments from internal discussions, outside agencies, adjacent landowners, and the public. There were some minor concerns raised; however, no concern stood out that would suggest a different course of action or another alternative.

1.5.2 Identified Concerns

Some of the concerns raised in Project Scoping were already planned for detailed analysis and are found in this Environmental Assessment. Other concerns were eliminated from detailed study, as directed by CEQ regulation §1500.1(b), 1500.2(b) and other sections, because they were determined to either be beyond the scope of this EA, or are minor concerns that could be resolved by slightly modifying individual proposed units or modifying the design features of the project.

Concern 1: Thinning in older stands

“The BLM should delineate out all the old-growth patches from the thinning units of younger, dense forests.”

“The Coos Bay BLM RMP says that trees 30 to 70 years old would be considered for thinning, not forests up to 80 years.”

“It is illegal to thin older stands in the Riparian Reserves.”

Discussion:

During the course of analysis, all units currently over 70 years of age have been dropped. Unit SC101 was thought to have a stand initiation date of 1930 (77 years old). However, recent stand exams place the age nearer to 60 years old. More than 60 trees were sampled for age and on one stand exam plot, only 4 trees were found to be close to 80 years old. Unit SC27 has been correctly identified as having a stand initiation date of 1940 (67 years old). However, the southwest portion has been dropped due to the large number of residual trees. The remaining portion of the unit does have some scattered residual trees which would be protected from damage through Project Design Features.

One proposed unit for commercial thinning (URC07) has a stand age that is 69 years. It is on a ridge with no Riparian Reserves, and has no density management treatment associated with it.

For clarification, The Coos Bay District RMP states that “*approximately* trees 30 to 70 years old” would be considered for thinning, dependent upon site specific factors (p.E-2). Also, there is no Federal statute preventing thinning in Riparian Reserves.

Concern 2: Variable density thinning and gap creation

“Thinning projects in the Matrix should apply variable density thinning techniques...”

“We support variable density thinning which allows young stands to develop into more complex and resilient forests.”

Discussion:

As part of the Timber analysis, variable density thinning is addressed under the discussion of Stand Density, which is located in Chapter 3. Within the Riparian Reserve, gap creation has been incorporated into the project design.

Concern 3: Build fewer roads and decrease road density

“Consider an alternative that builds less than 8 miles of new roads. Roads are damaging to the environment.”

“While we feel that temporary road construction is more appropriate than permanent road construction, temporary roads still channelize water, cause erosion, and conduct invasive weeds.”

Discussion:

The current road system within the project area was designed for clear-cut harvesting using large yarding towers (90' +) with little or no suspension, downhill cable yarding, and tractor yarding across streams. This type of road network is not appropriate for current harvest practices and new roads will be required to accommodate thinning operations. Proposed new construction would be located mainly on ridgetops or benches. Project Design Features have been incorporated to avoid impacts to water quality and prevent the spread of noxious weeds. Helicopter logging was determined to be unfeasible economically, and thus does not meet the Purpose and Need. There would be a net reduction of 5.7 road miles within the project area from the decommissioning of roads. In Chapter 2 there is a lengthy discussion of the project area road network, new road construction, renovation, and decommissioning. Analysis of the effects of roads to water quality is included in Chapter 3.

Concern 4: Road Activities requiring cutting of older, remnant trees

“Some new roads proposed could cut down older trees, larger trees, or remnant old-growth trees.”

“new road in T30sR9w Section 7, ...is not a ridge-top road....side-hill construction.”

“new road proposed in T29s R9w, Section 21 ...northeastern part...accesses only a small part of a thinning unit. The EA should consider not thinning that area...”

A new road proposed in T29s, R9w, Section 31 that goes between a 70 year old stand and a 250 years old stand...new road could more easily effect old-growth...”

Discussion:

None of the proposed road activities would require the removal of trees designated as suitable nesting habitat for marbled murrelets or northern spotted owls.

Part of the unit accessed by the road in T30S-T9W-S7 has been dropped from consideration due to low stocking levels within the stand. The road length has been reduced and is now ridge-top or on a stable bench. The unit accessed by the proposed road in T29S-R9W-S21 has also been dropped because of low stocking levels. Finally, the new road in T29S-R9W-S31 is still proposed. However, surveys are being conducted for marbled murrelet presence in the adjacent stand. Daily timing restrictions may be required and would be implemented to limit noise disturbance impacts to nesting birds if found to be present. No northern spotted owls are in the area.

Concern 5: Soil Compaction from harvest activities

“One of your evaluation criteria should be whether any degradation of soil offset by long-term benefits brought about by the proposed action.”

“And ground-based logging that allows heavy equipment off roads may cause significant soil disturbance that would not be offset by any intended benefits to the vegetation.”

Discussion:

The Coos Bay District RMP has ground-based yarding guidelines of keeping “less than 12 percent of harvest area affected by compaction.” Although some minimum disturbance to the soil layer would occur from both ground-based and skyline yarding, mitigation against disturbance using Project Design Features would provide necessary soil protection. These include: dry season operations for ground-based equipment, designated main forwarding corridors, use of pre-existing skid trails, and minimizing harvester passes over slash layers.

Concern 6: Special Status Species

“Special status species surveys must be completed prior to developing NEPA alternatives and before the decision is determined. On-the-ground field reconnaissance surveys must be done and used to develop NEPA alternatives.”

Discussion:

Applicable surveys have been conducted as part of project development.

Concern 7: Old-growth dependent species

“Impacts to old-growth species should be discussed in detail in the EA. This should include an effects analysis on such species as the goshawk, bats, woodpeckers, Pine Marten, red tree voles, Northern Spotted Owl, Marbles Murrelet, Bald Eagle, and other special status species listed in applicable management plans.”

Discussion:

A thorough analysis of spotted owl dispersal habitat, spotted owl prey species (including the red tree vole), and federally listed wildlife species, is included in the Biological Assessment associated with this project.

Special Status Species that may be present within the action area, as well as species of concern under the Migratory Bird Species Act, are addressed in Chapter 3.

Concern 8: Snags and down wood

“Special attention to snag and down wood habitat is needed...”

“Traditional thinning would reduce the recruitment of dead trees and down wood and further simplify the forest structure for many decades.”

Discussion:

Project Design Features have been included to limit damage to current levels of snags and down wood. Additionally, snag and down wood creation have been incorporated into project design and are included in the analysis under Stand Structure.

Concern 9: Economic viability of harvests

“Seasonal and wildlife restrictions often make timber sales extremely difficult to complete within contract timelines.”

“...offer sales that would allow winter harvesting on improved roads or allow for roads to be improved so winter harvesting can be accomplished.”

Discussion:

The BLM proposes most of the project activities to occur within the summer. However, analysis has been conducted on some roads that could be rocked to avoid seasonal disturbance to nesting murrelets and northern spotted owls. There is approximately 1.0 miles of new construction and 0.6 miles of renovation that have been analyzed for winter operations.

CHAPTER II. ALTERNATIVES

This chapter provides a description of each alternative and summarizes the environmental consequences of the alternatives.

This EA analyzes a no action alternative and a proposed action alternative. Analysis of the no action alternative is required under CEQ regulation §1502.14. For an action alternative to be considered it must meet the purpose and need while not violating any minimum environmental standards. The alternatives developed are consistent with the RMP and satisfy the purpose and need of implementing the RMP.

For harvest unit locations refer to Maps 3(a) -3(m). Appendix D of the RMP ROD describes the Best Management and Conservation practices for harvest related activities while Appendix E describes the silvicultural objectives of commercial thinning and density management thinning. Research by Tappeiner *et al.* (1997), Poage and Tappeiner (2002) and others (Muir *et al.* 2002) also guide density management treatments.

All quantifications (i.e. acreages, mileages, etc.) are based on estimates obtained from geographic information systems (GIS). Final numbers could vary slightly as the plans are translated to the ground. Harvest volumes for the commercial thinning and density management treatments are estimates derived from stand exam information. These volume estimates are variable and actual volume harvested may differ.

2.1 NO ACTION ALTERNATIVE

The No Action Alternative provides a baseline for the comparison of the alternatives. This alternative describes the existing condition and the continuing trends. Selection of this alternative would not constitute a decision to reallocate these lands to non-commodity uses. Future harvesting in this area would not be precluded and could be analyzed under a subsequent EA.

The project area would not receive the treatments described in this document in the foreseeable future. Ongoing activities would continue to occur. These include silvicultural activities in young stands, compliance with Oregon fire control regulations, construction of roads across BLM land under existing right-of-way agreements, routine road maintenance, control of noxious weeds, and projects covered by earlier records of decision. Timber harvest on adjacent private lands would occur and would be guided by Oregon Forest Practices Act.

2.2 PROPOSED ACTION ALTERNATIVE

The proposed action is to implement silvicultural treatments on approximately 1400 acres of BLM administered lands. This action would include thinning of conifer stands in the GFMA and Riparian Reserve (RR) land-use allocations. All of the thinning treatments in this action would yield commercial wood products; however, thinning in the GFMA is labeled commercial thinning (CT) while thinning in the RR is called density management thinning (DMT) because of differing objectives. Thinning is a harvest practice applied to forest

stands intended to redistribute the growth of a stand on individually selected trees. In a commercial thinning, surplus trees are removed from the site and are used for commercial wood products. The standing trees left on the site can then take advantage of the increased growing space.

Table II-1: Project Area Acres* and Locations for Each Proposed Sale

Sale Name	No. of Units	Estimated Commercial Thinning Acres (Matrix)	Estimated Density Management Acres (RR)	Total Treated Acres	Dropped or Buffer Acres	Township	Range	Section
Mister Slate CT	10	194	80	274	249	30 S.	9 W.	17, 21, 33
Rock Bottom CT	6	91	18	109	23	29 S.	10 W.	35
Rocky Top CT	9	294	128	422	80	29 S.	9 W.	9, 21
Pink Panther CT	11	138	94	232	129	30 S.	9 W.	5, 7
Busy Signal CT	8	64	78	142	112	29 S.	9 W.	29, 31, 33
Heavy Bone CT	4	155	49	204	18	30 S.	10 W.	9, 15
Totals	44	936	447	1383	611			

*Based upon final field review, some minor adjustments in these acreage estimates may be necessary.

All proposed units would be harvested using a combination of skyline cable and ground-based equipment (Table II-2). Cutting of trees would either be done manually with chainsaws or with a mechanical harvester. One-end log suspension would be required during inhaul for the skyline cable system. Tracked or rubber-tired equipment capable of transporting logs completely clear of the ground during dry soil conditions would be used for the ground-based areas (e.g. forwarder). This equipment would follow existing skid trails where possible, travel over a layer of slash, and be restricted to slopes less than 35% to prevent soil compaction. Specific Project Design Features are located in Section 2.2.3.

Table II-2: Yarding Systems by Units

Sale Name	EA Unit No. *	Cut-to-length/forwarder	Skyline cable		Unit Acres
			Downhill yarding	Uphill Yarding	
Mister Slate CT (274 ac.)	SC13	0	3	72	75
	SC14	0	0	18	18
	SC16	0	0	10	10
	SC17	5	0	30	35
	SC18	0	0	68	68
	SC19	0	10	10	20
	SC21	0	0	6	6
	SC22	0	0	12	12
	TM01	0	0	7	7

Sale Name	EA Unit No. *	Cut-to-length/ forwarder	Skyline cable		Unit Acres
			Downhill yarding	Uphill Yarding	
	TM02	13	0	10	23
		18	13	243	274
Rock Bottom CT (109 ac.)	URC01	44	0	0	44
	URC02	7	6	7	20
	URC02S	0	0	22	22
	URC17	0	0	7	7
	URC18	0	0	11	11
	URC19	0	0	5	5
		51	6	52	109
Rocky Top CT (422 ac.)	URC06	0	5	118	123
	URC07	23	0	0	23
	URC09E	0	7	14	21
	URC09W	0	0	36	36
	URC10	0	7	144	151
	URC10N	0	0	20	20
	URC11	0	0	21	21
	URC12	0	0	8	8
	URC13	11	0	8	19
		34	19	369	422
Pink Panther CT (232 ac.)	SC06	23	0	0	23
	SC07	0	7	13	20
	SC07W	0	6	11	17
	SC08	0	7	40	47
	SC09	0	0	47	47
	SC25N	0	0	5	5
	SC25S	0	0	6	6
	SC26	17	0	0	17
	SC27	2	0	43	45
	SC29	0	0	3	3
	SC31	0	0	2	2
		42	20	170	232
Busy Signal CT (142 ac.)	HMF02	0	3	21	24
	HMF03	0	1	3	4
	HMF04	0	0	39	39
	HMF06	0	0	37	37
	URC03	0	0	13	13
	URC03N	0	2	0	2
	URC04	0	0	17	17
	URC04N	0	0	6	6
		0	6	136	142
Heavy Bone CT (204 ac.)	SC02	27	0	36	63
	SC03	0	0	33	33

Sale Name	EA Unit No. *	Cut-to-length/ forwarder	Skyline cable		Unit Acres
			Downhill yarding	Uphill Yarding	
	SC04	0	0	29	29
	SC02S	6	0	73	79
		33	0	171	204
		178	64	1141	1383

This alternative would contribute to the need for forest products by providing an estimated 18 MMbf of timber through a combination of commercial thinning and density management treatments. Commercial thinning of young stands would provide an estimated 12 MMbf of timber towards meeting the Districts' ASQ. Density management in Riparian Reserves would not contribute to the ASQ; however, approximately 6 MMbf of timber would be supplied to the local economy.

Road-related activities include new construction, road renovation, improvement, and maintenance, and road decommissioning. These activities and haul route information is summarized in Table II-3. There would be a net reduction of 5.9 road miles within the watershed from project-associated decommissioning. A thorough discussion of road activities is located in Section 2.4

Table II-3: Proposed Action Summary

Activity		Total	
Timber Harvest	Commercial Thinning acres (GFMA)	936 acres	
	Density Management acres (RR)	447 acres	
Timber yarding	Cable yarding	87%	
	Ground based yarding	13%	
Timber hauling	All Season/Gravel Roads	8.20 miles	
	All Season/ Paved Roads	44.0 miles	
	Dry Season/Dirt Roads	10.6 miles	
	Dry Season/Gravel Roads	3.0 miles	
Road Activities	Construction	4.1 miles	
	Renovation	14.1 miles	
	Improvement	0.7 miles	
	Decommissioning (Total)	10.7 miles	
	Decommissioning (Net)	5.7 miles	
	Haul Route Maintenance	47.0 miles	
Open Road Density on BLM (miles/mile ²)	Analysis Area	No Action	Proposed Action
		5.12	4.90
	Middle Fork Watershed (5 th Field)	No Action	Proposed Action
		4.33	4.27

2.3 SILVICULTURAL TREATMENTS

2.3.1 Variable Density Thinning

Public scoping indicated a preference for variable density thinning and suggested that variability was important to the development of forest structure necessary for many wildlife species and quality NSO habitat. Specifically, Oregon Wild submitted scoping comments which stated "...we support variable density thinning which allows young stands to develop into more complex and resilient forests. This means that thinning should be done in a way that creates ¼ to ½ acre gaps, dense patches, lightly thinned, moderately thinned, and heavily thinned patches in every stand". Also, Umpqua Watersheds and Oregon Wild submitted "...If structurally simple stands in the matrix can be modified to be more complex in terms of species diversity, niche diversity, and dead wood abundance, they will support better foraging opportunities, which will greatly improve the quality of dispersal habitat."

Direct application of variable density thinning is not necessary to meet the objectives for commercial thinning in the Matrix LUA. One RMP Objective for Timber Resources is to *"Manage developing stands on available lands to promote tree survival and growth and to achieve a balance between wood volume production, quality of wood, and timber value at harvest"* (p. 52). Management Directions specifically state that silviculture treatments are to be designed to prevent the development of undesirable stand characteristics (p. 53).

Site specific direction for commercial thinnings also guides prescription development within the Matrix. These include: increase the proportion of merchantable volume in the stand; produce larger, more valuable logs; anticipate mortality of small trees as the stand develops; maintain good crown ratios and stable, windfirm trees; accelerate the development of trees that can later provide large-diameter snags and down logs; manage species composition; and promote development of desired understory vegetation (p. E-2). A variable density thinning would not meet these management objectives on the Matrix land-use allocations any better than a conventional, less costly to mark and administer, commercial thinning prescription.

However, there are other variables in project implementation that do result in unintended variable densities in the Matrix LUA. Chapter 3 describes how traditional "thinning from below" on the Coos Bay District does result in some variation in stand density.

Variable density treatments would be applied to the Riparian Reserve LUA. This would meet the RMP direction for Timber Management within the RR, *"Apply silvicultural practices for Riparian Reserves to control stocking, re-establish and manage stands, and acquire desired vegetation characteristics needed to attain ACS objectives"* (p. 13). It is generally accepted that Riparian Reserves that are complex and exhibit late-successional characteristics such as large trees, snags, down logs, and multi-storied canopies allow ecological processes to occur that provide for healthy watersheds. Since the RMP does not allow "Regeneration Harvest" of conifer stands in the RR, the transition from young, dense stands to functional late-successional stands can be allowed to run its full course. The creation of gaps and the retention of high density areas is the beginning of that transition.

2.3.2 Commercial Thinning Prescription

The commercial thinning (CT) treatments in the GFMA are designed to:

- increase the proportion of merchantable volume in the stand
- produce larger, more valuable logs
- anticipate mortality of small trees as the stand develops
- maintain good crown ratios and stable, wind firm trees
- accelerate development of trees that can later provide large-diameter snags and down logs
- manage species composition

The GFMA stands would be thinned from below by primarily cutting the overtopped, intermediate, and co-dominant conifers (Douglas-fir, western hemlock, and grand fir) and red alder to obtain the desired relative density. Other species of conifer and hardwood may be retained to provide species, spatial, and structural diversity. The residual trees would be distributed across the site to rapidly capture the growing space made available by the thinning and would be the trees with the largest crowns and diameters relative to other trees in the immediate area.

Relative density (RD) “expresses the actual density of trees in a stand relative to the theoretical maximum density (RD100) possible for trees of that size” (Hayes *et al.* 1997). It is a measure used to estimate when a stand reaches a density where diameter growth begins to decline and suppression mortality increases (Table II-4). RD increases for a given number of trees per acre as stem diameters increase. RD decreases for a given stem diameter if the number of trees per acre decrease. At this stage, stands require manipulation in density to maintain a positive growth rate.

Dense young stands in the GFMA would be thinned to a relative density of roughly 35. Thinning to this density is considered a light thinning typical for stands intended for timber production (Hayes *et al.* 1997). For Douglas fir stands, a RD of 55 is at the lower threshold of imminent competition mortality and trees have small live crowns that cover only the upper 35% to 40% of the stem (Drew and Flewelling 1979). A RD of 35 is considered full site occupancy from an operational perspective. A stand with a RD of 35 is producing approximately 75% of the gross volume periodic annual increment of what that stand would produce if it had sufficient stocking to be at the lower limit of self-thinning (Long *et al.* 1981). As depicted in Table II-4, all stands in the project area exceed this density. A Douglas-fir stand with a RD of 25 to 35 is considered less than fully occupied and capable of understory development (Hayes *et al.* 1997). Stands with a RD of 15 are just at the threshold of crown closure – when the entire area of the stand is first covered by crown.

The prescriptions would result in an average of 92 trees per acre being retained with a range between 50 and 130 (variable densities). Post-treatment canopy closure would be greater than 60%. Port-Orford cedar (POC) would be left at a spacing no closer than 25' x 25' to maintain presence in the stand and reduce likelihood of POC root rot disease spread. Pacific yew, Western redcedar, myrtlewood, and big leaf maple would be reserved to maintain species diversity.

2.3.3 Density Management Thinning Prescription with Gaps

The density management thinning (DMT) treatments in the RR are designed to:

- promote development of large conifers
- recruit large woody debris
- improve diversity of species composition and stand density
- promote forest health
- promote an understory/shrub layer
- develop within-stand complexity

Density management thinning prescriptions are applied to accelerate the growth of individual trees within the Riparian Reserves. DMT differs fundamentally from conventional commercial thinning in that the intent of treatment is to redirect the stand development trajectory to provide desired future stand structural conditions. Operationally, DMT is very similar to conventional commercial thinning. In this Alternative, 60% of the Riparian Reserve area would be treated by thinning, 25% would remain untreated, and the remaining would be in gaps.

Stands would be thinned from below to a relative density of 35 by cutting the overtopped, intermediate, and co-dominant conifers (Douglas-fir, western hemlock, and grand fir) to obtain the desired relative density. The prescription would be the same as in GFMA stands, except for gap creation and alder retention. The Riparian Reserve width of one site potential tree height has been calculated to 200 feet in the Middle Fork Coquille Watershed.

There would be creation of ¼-acre gaps within this buffer. Small site-scale disturbances often result in canopy gaps within a stand. These features have been noted as creating heterogeneity of understory plant communities (Fahey and Puettmann 2007). To begin to restore late-successional characteristics, gap creation has been incorporated into the Riparian Reserve prescription. This is designed to improve diversity and develop within-stand complexity. The target area of gaps would be 13-18%, which is the average area of gaps found in late-successional stands (Spies and Franklin 1991, Spies *et al.* 1990, USDA 1993). A ¼-acre gap has a radius slightly larger than 50 feet and averages 57 trees in these stands. Approximately 3 gaps per 500 feet of Riparian Reserve would be created. These gaps would also be located a minimum of 50 feet from roads.

Alder found in the Riparian Reserves would generally be left standing. Alders cut to facilitate yarding corridors would be left on-site. Additionally, wherever feasible, alder dominated stands directly adjacent to streams have been buffered out of unit boundaries.

A 50-foot no-harvest buffer would be applied to all identified streams immediately adjacent to stream channels. These areas are to remain unthinned except for yarding corridors that may be needed. There are 15 stream segments (17,000 feet) that would require approximately 118 yarding corridors through them. Yarding corridors would impact about 1500 feet of stream length and 3.25 total acres. Trees that are cut within the no-harvest buffer would be left on site.

Table II-4: Comparison of stand data pre- and post- thinning using the SPS growth model

			Residual Stand (SPS)				Cut (SPS)				Current Stand (SPS) "No Action"						
Sale Name	EA Unit #	Upper Dia. Limit-Max	TPA (Trees Per Acre)	BA/Ac (Basal Area)	Avg. DBH (Diameter Breast Height)	Net Vol/Ac (MBF)	TPA	BA/Ac	Avg. DBH	Net Vol/Ac (MBF)	TPA	BA/Ac	Avg. DBH	RD (Relative Density)	Site Index	2007 BH Age*	Est. Total Age**
Mister Slate CT	SC13	13	111	134	14.9	22.3	154	87	10.2	12.0	261	212	12.2	61	109	39	46
	SC14	12	119	132	14.2	20.2	137	55	8.6	5.3	254	179	11.3	53	115	36	43
	SC16	13	120	131	14.1	21.9	109	48	9.0	7.1	227	167	11.6	49	110	33	40
	SC17	13	107	136	15.3	24.7	92	45	9.5	6.7	197	172	12.6	48	118	38	45
	SC18	13	130	128	13.4	22.1	122	57	9.2	7.7	248	170	11.2	51	132	31	38
		15	114	134	14.6	22.2	116	77	11.0	14.3	227	198	12.6	56	116	42	49
	TM02	13	118	132	14.3	17.8	155	89	10.2	8.6	270	204	11.8	59	108	30	37
Rock Bottom CT	URC01	17	84	148	17.9	31.3	114	82	11.5	13.9	195	218	14.3	58	127	42	49
	URC02	18	53	172	24.4	43.4	166	111	11.0	18.2	216	270	15.1	69	126	57	64
	URC02S	18	53	172	24.4	43.4	166	111	11.0	18.2	216	270	15.1	69	126	57	64
	URC17	15	101	138	15.9	24.3	141	87	10.6	15.5	237	211	12.8	59	134	34	41
	URC18	15	101	138	15.9	24.3	141	87	10.6	15.5	237	211	12.8	59	134	34	41
	URC19	15	101	138	15.9	24.3	141	87	10.6	15.5	237	211	12.8	59	134	34	41
Rocky Top CT	URC06	15	81	150	18.3	27.5	214	131	10.6	18.6	287	266	13.0	74	113	43	50
	URC07	19	64	162	21.4	36.1	203	204	13.6	36.0	261	354	15.8	89	105	62	69
	URC09E	13	100	139	15.9	23.0	179	96	9.9	10.9	273	216	12.0	62	124	35	42
	URC09W	13	100	139	15.9	23.0	179	96	9.9	10.9	273	216	12.0	62	124	35	42
	URC10	15	92	144	16.9	25.2	118	84	11.4	12.0	206	212	13.7	57	130	32	39
	URC10N	15	103	138	15.6	20.1	192	183	13.2	27.1	276	290	13.9	78	110	42	49
	URC11	13	116	132	14.5	18.1	68	51	11.7	6.7	181	167	13.0	46	125	28	35
	URC12	13	102	139	15.7	20.4	215	117	10.0	13.3	304	227	11.7	66	146	23	30
	URC13	19	73	154	19.6	31.3	143	116	12.2	16.9	213	258	14.9	67	113	52	59
Pink Panther CT	SC06	14	112	135	14.8	19.2	159	106	11.0	14.7	265	222	12.4	63	125	28	35
		13	92	143	16.8	21.8	127	73	10.3	9.6	214	201	13.1	56	117	32	39
		16	72	155	19.8	30.6	192	122	10.8	14.3	260	263	13.6	71	120	46	53
	SC08	14	95	142	16.5	22.5	91	51	10.1	6.9	183	181	13.4	49	113	39	46
	SC09	14	100	139	15.9	20.4	174	97	10.1	11.8	270	224	12.3	64	111	35	42
	SC25N	15	78	152	18.8	31.4	79	62	12.0	10.5	156	205	15.5	52	131	45	52
	SC25S	15	78	152	18.8	31.4	79	62	12.0	10.5	156	205	15.5	52	131	45	52
	SC26	15	91	144	16.9	21.6	143	119	12.3	14.8	230	245	14.0	65	121	31	38
	SC27	16	73	174	20.9	40.4	126	100	12.1	16.9	196	264	15.7	67	120	55	62
	SC29	14	83	149	18.1	26.2	67	43	10.8	5.8	149	182	15.0	47	114	45	52
	SC31	15	78	152	18.8	31.4	79	62	12.0	10.5	156	205	15.5	52	131	45	52
Busy Signal CT	HMF02	13	112	134	14.8	21.3	134	71	9.8	8.8	243	190	12.0	55	123	30	37
	HMF03	13	112	134	14.8	21.3	134	71	9.8	8.8	243	190	12.0	55	123	30	37
	HMF04	13	92	146	17.0	25.8	77	50	10.9	7.0	167	183	14.1	49	131	32	39
	HMF06	14	89	146	17.3	26.9	156	109	11.3	15.7	240	239	13.5	65	133	33	40
		15	97	140	16.2	26.5	181	138	11.8	23.1	270	257	13.2	71	134	33	40
	URC03	13	96	141	16.4	21.9	76	46	10.5	5.6	170	175	13.7	47	113	35	42
	URC03N	13	96	141	16.4	21.9	76	46	10.5	5.6	170	175	13.7	47	113	35	42
	URC04	17	66	178	21.8	47.7	106	62	10.4	9.7	169	225	15.6	57	133	55	62
	URC04N	17	66	178	21.8	47.7	106	62	10.4	9.7	169	225	15.6	57	133	55	62
Heavy Bone CT	SC02	14	93	142	16.7	22.3	191	114	10.4	15.5	276	240	12.6	68	115	31	38
	SC03	11	104	138	15.6	19.1	244	100	8.7	10.3	339	218	10.8	66	109	33	40
	SC04	18	65	159	21.1	42.2	270	203	11.7	44.8	318	344	14.1	92	143	46	53
	SC02S	17	67	161	21.0	34.0	181	121	11.0	17.0	243	272	14.3	72	110	52	59
	Average		92	146	17	27	142	91	11	13	229	222	13	61	122	39	46
	Minimum		53	128	13	18	67	43	9	5	149	167	11	46	105	23	30
	Maximum		130	178	24	48	270	204	14	45	339	354	16	92	146	62	69

2.3.4 Stand Structure

The following table shows activities, if needed, which would be implemented to meet the management direction for harvest units within Matrix lands to retain snags sufficient to “support species of cavity-nesting birds at 40 percent of potential population levels.” There are also requirements for down wood levels. Table II-5 summarizes the analysis relating to stand structure located in Chapter 3. These activities would occur in both CT and DMT areas.

Table II-5: Snag and/or Down Wood (DW) creation by Units where applicable.

Sale Name	Unit Number	Activity	Sale Name	Unit Number	Activity
Mister Slate	SC 13	None	Pink Panther	SC 06	None
	SC 14	None		SC 07	None
	SC 16	None		SC 07W	DW
	SC 17	None		SC 08A	Snags
	SC 18A	None		SC 09	Snags
	SC 18B	None		SC 25N/S	DW
	TM 02	None		SC 26	Snags
Rock Bottom	URC 01	Snags/DW		SC 27	Snags/DW
	URC 02/02S	DW		SC 29	None
	URC 17	Snags		SC 31	DW
	URC 18	Snags	Busy Signal	HMF 02/03	None
	URC 19	Snags		HMF 04	DW
Rocky Top	URC 06	Snags		HMF 06	DW
	URC 07	Snags/DW		HMF 06A	Snags
	URC 09E/W	Snags		URC 03/03N	Snags
	URC 10	DW		URC 04/04N	DW
	URC 10N	None	Heavy Bone	SC 02	Snags
	URC 11	None		SC 03	None
	URC 12	Snags		SC 04	Snags/DW
	URC 13	DW		SC 02S	Snags/DW

2.4 ROAD MANAGEMENT

Road management for this project consists of developing and maintaining a transportation system that serves the project needs in an environmentally sound manner as directed by the Coos Bay RMP/ROD. This would involve construction of new roads, renovation or improvement of existing roads, maintenance of roads necessary to facilitate harvest operations, and decommissioning of roads at the completion of the project. Road work would be completed according to the BMPs in Appendix D of the RMP and the Western Oregon Districts Transportation Management Plan (USDI 2002).

Because this project proposes summer-time harvest for many of the timber units, most of the new construction and existing roads used to access the units would not be surfaced with crushed rock. This design is intended to reduce logging cost. However, in response to a concern brought up during scoping, this document will address the effects of surfacing approximately 1.6 miles (approximately 1.0 new/ 0.6 renovation miles) of dirt roads to allow for all-season harvest and timber haul operations. This would allow harvest operations to occur outside of established timing restrictions pertaining to marbled murrelet and spotted owl nesting periods. The addition of Project Design Features to prevent potential impacts from these changes eliminates the need to analyze this difference as a separate alternative.

Tables II-6 and II-7 show the differences. Road by road information is included in the two tables in Appendix A. The total road closure mileages would remain the same.

Table II-6: BLM proposal - Least amount of rocked roads

	Road Work (miles)						Road Closure (miles)			
	New Construction		Renovation		Improvement		Full Decomm		Block and Waterbar (Decomm)	
	Rock	Dirt	Rock	Dirt	Rock	Dirt	Rock	Dirt	Rock	Dirt
Mister Slate CT	0.05	0.22	0.74	0.13	0.18	-	-	0.36	0.05	-
Rock Bottom CT	-	0.72	1.60	0.8	-	0.09	-	0.8	0.4	-
Rocky Top CT	-	0.89	1.74	3.04	-	-	-	3.02	0.69	0.88
Pink Panther CT	0.04	0.97	0.73	0.29	.06	-	-	1.26	0.16	-
Busy Signal CT	0.13	-	1.10	2.06	-	.05	-	0.95	0.13	0.62
Heavy Bone CT	-	1.08	1.61	0.29	0.30	-	-	1.08	0.3	-
Sub-total	0.22	3.88	7.52	6.51	0.54	0.14	-	7.47	1.73	1.5
Totals	4.1		14.2		0.7		7.47		3.23	
							10.7			

Table II-7: Most rocked roads to facilitate more winter activities

	Road Work (miles)						Road Closure (miles)			
	New Construction		Renovation		Improvement		Full Decomm		Block and Waterbar (Decomm)	
	Rock	Dirt	Rock	Dirt	Rock	Dirt	Rock	Dirt	Rock	Dirt
Mister Slate CT	0.20	0.07	0.74	0.13	0.18	-	-	0.21	0.20	-
Rock Bottom CT	-	0.72	1.60	0.70	0.09	-	-	0.71	0.49	-
Rocky Top CT	0.16	0.73	2.15	2.63	-	-	-	2.61	1.1	0.88
Pink Panther CT	0.74	0.27	0.73	0.29	.06	-	-	0.56	0.86	-
Busy Signal CT	0.13	-	1.19	1.97	-	0.05	-	0.95	0.22	0.53
Heavy Bone CT	0.6	1.08	1.61	0.29	0.30	-	-	1.08	0.3	-
Sub-total	1.23	2.87	8.01	6.02	0.63	0.05	-	6.12	3.17	1.41
Totals	4.1		14.2		0.7		6.12		4.58	
							10.7			

2.4.1 New Road Construction

New road construction would consist of approximately 0.22 miles of rocked surface roads and 3.88 miles of dirt surfaced roads (Table II-6). The type of road to be constructed and the location of the road would generally be governed by BMPs. These are listed in the Project Design Features in Section 2.2.3. No new road construction would occur within the Riparian Reserves; however, some roadside landings constructed along existing roads would be in the upland portion of the Riparian Reserve. Landing construction would consist of creating wide

spots to facilitate safe yarding and loading of logs and are typically about ¼ acre in size, which includes the existing roadbed. As development of each individual timber sale progresses and becomes more refined, some short unplanned spur roads or landings may be required that better facilitate harvest operations.

2.4.2 Road Renovation/Improvement

Renovation includes those roads that have generally been neglected, may not have been used in several decades, are closed with vegetation or debris, and/or would require substantial work within the road prism to return the roads back to their original condition. Activities may include clearing brush and/or trees within the road prism, cleaning or replacing ditch relief culverts, restoring proper road surface drainage, grading, or other maintenance.

Road improvement consists of increasing the existing road standard to a higher design standard by adding capital improvements such as additional ditch relief culverts, surfacing existing dirt roads, or adding rock to existing rocked roads.

Rocked surfaced roads would extend cable harvesting and hauling during the winter season to allow work outside of murrelet and owl seasonally-restricted periods and to reduce yarding damage in stands where hemlock would be a major component of the residual stands. These types of improvements are the main difference between the two tables above, which detail total lengths for road renovation, improvement, and new construction.

2.4.3 Road Decommissioning

A total of 10.7 miles of road would be decommissioned or fully decommissioned resulting in a net decrease of 5.7 miles of open road in the watershed. This equates to reduction in the open road density on BLM lands in the watershed of .06 miles/sq. mile.

Roads to be “Decommissioned” would be closed to vehicles on a long term basis (> 5 years) but may be opened and maintained for future use. They would be left in an erosion-resistant condition by installing waterbars, eliminating diversion potential at stream channels, stabilizing or removing fills on unstable areas, and treating exposed soil areas. All new construction that is to be rocked would be decommissioned.

Roads to be “Fully Decommissioned” would also be left in an erosion-resistant condition; however, additional measures designed to restore hydrological flow such as tilling of the road bed and removing stream crossing fills and culverts may be adopted. All dirt-surfaced new construction would be fully decommissioned with the exception of Spur URC06-1. This road would be decommissioned and used at a later date. There are 4 intermittent stream crossing culverts on existing roads in EA unit URC06 that would be removed.

2.4.4 Haul Route Maintenance

There would be a total of 47.1 miles of existing roads that would receive maintenance to facilitate traffic associated with the proposed action. This routine maintenance consists of, but is not limited to, brushing to control vegetation, cleaning of drainage ditches, maintaining

the road surface (such as grading), and removal of road debris creating safety hazards (slough material, fallen trees, etc.). These roads are currently open for travel and are maintained on a regular basis thereby only requiring minimal maintenance for this project. These road numbers are not included in the renovation/improvement section.

Table II-8: Routine Maintenance

Haul Route Maintenance (Miles)			
Surface Type	Paved	Rock	Dirt
Miles	16.8	30.3	0.0
Total	47.1		
Perennial/Fish Bearing Streams Crossed by Haul Route	17/6		
Intermittent Streams Crossed by Haul Route	121		

Haul route maintenance numbers would not change between summer and winter dominated activities.

2.5 DESIGN FEATURES FOR THE PROPOSED ACTION

This section describes measures designed to avoid, minimize or rectify impacts on resources and are included as part of the proposed action. Design features are site-specific measures, restrictions, requirements, or mitigations included in the design of a project in order to reduce adverse environmental impacts.

2.5.1 Harvest Operations

- Cable yarding, with one-end or full log suspension would be required.
- Approximately 60% or greater canopy closure would be maintained within treatment units.
- In the designing of roads, landings, and yarding corridors, large remnant trees would be avoided.
- Special habitat features, such as wetlands, would be buffered out of the units. Tree felling would be accomplished by a feller-buncher or hand-felled with chainsaws.
- Trees would be felled away from all unit boundaries, mainline roads, roads not planned for closure or decommissioning, and property lines.
- Existing snags would be reserved from cutting except those that must be felled to meet safety standards. Snags felled or accidentally knocked over would be retained on site.
- Existing down logs in decay classes 3, 4, and 5 would be reserved. Existing down logs greater than 20" diameter on large end would be reserved from cutting and/or removal during logging operations. These down logs would be protected from damage during logging operations to the extent possible.

Ground-Based areas

- Ground-based equipment would be restricted to the dry season when soil moistures are below the 25% threshold. This threshold is defined as when soil moisture content measurements, taken 2 to 4 inches below the organic layer, are below 25%. This is typically May through October. Soil moisture contents above 25% may require the discontinuation or limitation of ground-based operations in order to prevent excessive compaction.
- Ground-based equipment would not enter stream channels and wetlands.
- If tractors are used for log skidding, skid trails would be designated with the objective of having less than 12 percent of a harvest area affected by compaction. Existing skid [trails] would be used to the extent practical (ROD, D-5 #8a).
- Tractors would be restricted to slopes of less than 35 percent and used only during the dry season (ROD, D-5 #8b).
- Forwarder/harvester operations would utilize slash layers created by the harvesting process to limit bare soil exposure.
- A crawler tractor may be used in conjunction with road construction to skid logs within the road construction right-of-way.
- Drainage and erosion control measures, including water-barring of skid trails, would be applied to bare soil areas following use and prior to winter rains (ROD, D-5 #8f).
- Access points for skid trails would be blocked with logging debris to prevent vehicle access after harvest operations are completed.
- A skyline cable system would be permitted to operate during the wet season in ground based areas; however, road surface condition may restrict timber haul.

Cable-Yarding areas

- A skyline cable system with 75-foot lateral yarding capability would be required.
- For down-hill yarding operations, one-end suspension would be required.
- Full log suspension or seasonal yarding restrictions would be required as operationally feasible on the following fragile soil areas as designated in the TPCC system:
 - FGR2 – Portions of Units HMF 03,04,06; SC 08,09,19,21,22
 - FGNW – Portions of Units HMF 04,06; SC 04,19
- Reserve trees cut to facilitate yarding corridors outside of no-harvest buffers would be felled and yarded to landings.

- Cutting may be done with a mechanical harvester on slopes <35%, provided soil moistures are below the 25% threshold.
- Trees would be directionally felled upland away from no-harvest buffers. Trees that must be felled within this no-harvest buffer to provide cable yarding corridors would be felled toward the stream channel and retained on site.
- The location, number, and width of corridors (within no-harvest buffers) would be specified prior to yarding, and natural openings would be used as much as possible (ROD, D-5 #2).
- Skyline corridors would be a maximum of 12 feet wide. Distance between skyline corridors would be a minimum of 150 feet apart at the widest point where feasible.
- Full log suspension would be required over stream channels.
- Skyline corridors would be perpendicular to streams as much as possible to minimize the total length of openings created by yarding corridors along stream channels.

Fuel Treatments

- Hazardous fuel reduction measures would be conducted within units along those roads that are not identified for closure or decommissioning after harvest operations. These measures would include pulling back all slash greater than 2 feet in length and up to 6 inches diameter to within 20 feet on each side of these roads.
- Heavy concentrations of slash on landings and roads resulting from cable yarding operations would be piled and burned. Piles would be minimal in number and free of soil and rock material. Placement of landing piles closer than 15 feet to reserved trees, snags, or suitable coarse woody debris would be avoided. Piles would be covered with black plastic and burning would generally occur during the late fall and winter months.
- Alternatively, landing piles of slash would be broken up and scattered throughout the harvest unit before equipment vacates the site.
- Applicable Oregon State Fire Laws would be followed. Burning of slash piles would comply with the Oregon Smoke Management Plan (2007 OAR 629-43-043).

2.5.2 Road Construction

New construction would use the applicable “Conservation Practices for Road and Landing Construction” Best Management Practices (p. D3-D4) found in the RMP. These include:

- ❖ Road and landing construction activities would be limited to the dry season, generally from [May] to October.

- ❖ Roads and landings would be designed and constructed to BLM standards, but be the narrowest and smallest sizes that would meet safety standards, objectives of anticipated uses, and resource protection. For this project, rocked roads would typically have a running surface of 16 feet, while natural surfaced roads may have a running surface between 14 and 16 feet.
 - ❖ Roads would be located on stable locations, such as ridge tops, stable benches or flats, and gentle-to-moderate side-slopes.
 - ❖ Stable end-haul (waste) sites would be located prior to end-hauling. These sites would be kept properly shaped, drained, and vegetated.
 - ❖ Road drainage would be designed to minimize soil erosion and stream sedimentation. Energy dissipators, culvert down pipes, or drainage dips would be used where water is discharged onto loose material and onto erodible or steep slopes.
 - ❖ Road surface shape (e.g. crowning, insloping, and outsloping) that meets planned use and resource protection needs would be used.
- Road drainage features (such as ditch-relief culverts) would be installed an appropriate distance upslope of stream crossings in order to route most of the ditch flow away from streams and onto forest soils where it can re-infiltrate. Depending on site conditions, this distance would generally be about 100 feet from the drainage feature outlet to the stream channel. The following table would be used as the guide for drainage spacing.

Table II-9: Guide for Drainage Spacing by Soil Erosion Classes and Road Grade.

Gradients (%)	Erosion Class		
	High	Moderate	Low
3-5	200	300	400
6-10	150	200	300
11-15	100	150	200
16-20	75	100	150
21-35	50	75	100
36+	50	50	50
Spacing is determined by slope distance and is the maximum allowed for the grade. Spacing in feet.			

- Bare soil areas created from landing and road construction would be mulched and seeded with a 50:50 mixture of certified weed free native grass species and a certified weed free non-native sterile rye and fertilized. If a native grass seed mixture was not available from Coos Bay BLM, a mixture of certified weed free native grass seed would be obtained from a BLM-approved commercial source.

Road Maintenance and Renovation

- Drainage and soil erosion control practices would be applied to renovated or reconstructed roads in the same manner as newly-constructed roads (ROD, D-4 #17). These may include, but are not limited to, dry season grading and ditch-relief culvert replacements, appropriate end-haul and disposal areas, and proper dispersal of water from ditch-relief culverts.

- Road maintenance activities would be planned to minimize soil erosion and subsequent stream sedimentation (ROD, D-4 #18). Maintenance would include, but is not limited to, grading to remove ruts, removal of bank slough, placement of silt trapping straw bales or other sediment control devices, and adding gravel lifts where needed in the road surface. Existing drainage ditches that are functioning and have a protective layer of non-woody vegetation would not be disturbed.
- Dirt roads and landings would receive seasonal preventative maintenance prior to the onset of winter rains. Seasonal preventative maintenance may include, but is not limited to cross-ditching, sediment control mats or devices, removing ruts, mulching, and barricades.

Haul

- Hauling on dirt-surfaced roads would be prohibited during the wet season, generally November through April.
- Road conditions would be monitored during winter use to prevent rutting of the rock surface.
- At designated stream crossings during winter haul, any offsite movement of sediment from the road or ditch flow near fish-bearing streams would be contained with suitable sediment control devices such as silt fencing, straw bales etc... Such control measures would allow for the free passage of water without detention or plugging. These control structures and applications would receive frequent maintenance and would be removed at the completion of haul. Once haul is completed, sediment retained by the filters would be removed and disposed in areas in which the sediment would not be delivered to stream channels.
- An additional lift of rock would be applied to the area of road that can influence the stream if erosion and sediment delivery is evident from the road tread near live stream crossings.
- If the ground is already saturated from winter rains and more than 1 inches of precipitation is predicted in the project area over the next 24 hours, then winter haul would be suspended. Operations would resume after the 24-hour suspension, except when another storm (exceeding 1 inch) is forecasted. Currently, precipitation predictions are based on the Quantitative Precipitation Forecast (QPF) maps from The Hydrometeorological Prediction Center internet site: <http://www.hpc.ncep.noaa.gov/html/fcst2.html>. A similar predictive model internet site may be used if this site should be unavailable in the future.

Road Closure/Decommissioning

- For roads to be closed or less than fully decommissioned, water bars would be installed to route surface runoff to vegetated areas. Newly constructed dirt roads would be water-barred before the onset of the rainy season, if necessary.

- Where roads are designated for full decommissioning, slash material would be scattered over the decompacted road surface to protect and reintroduce organic material to the soil.
- For roads to be fully decommissioned, the road surface would be decompacted to a depth of at least 8 inches.

2.5.3 Fisheries/Aquatic Resources

- Stream channels would have at a minimum 50-foot (slope distance) no-harvest buffer. Buffer distances would be measured starting from a stream bank or the streamside edge of vegetation, whichever is greater.

2.5.4 Special Status Species-Including T & E Species

- Daily Operating Restrictions limiting harvest activities from two hours after sunrise to two hours before sunset would be implemented on applicable units. These units are identified in Chapter 3 in the marbled murrelet discussion.
- All timber sale contracts include a standard provision that includes management guidelines for species that may be found after the contract is awarded. These species include Threatened & Endangered species, occupied marbled murrelet sites, active raptor nests, federal proposed and candidate species, Bureau Sensitive or State listed species protected under BLM Manual 6840.
- All Bureau Sensitive non-vascular plant species found during pre-disturbance surveys will be protected using known site management recommendations developed by the Coos Bay District (Brian *et al.* 2002). A conservation assessment will be used to assess the effects of the proposed action on any Bureau Sensitive fungal species suspected of occurring in the project area.

2.5.5 Noxious Weeds

- To prevent the introduction and spread of noxious weeds during the contract period, equipment would be washed prior to entering the project area.
- Vehicles and equipment would be required to stay on road and landing surfaces, except equipment specifically designated to operate off roads and landings (e.g. mechanical harvesters).
- To the extent practical, travel would be avoided or minimized through weed-infested areas.

2.5.6 Port-Orford cedar

- To retain existing species diversity, all Port-Orford cedar (POC) 7 inches DBH and greater would be retained. The three exceptions are: when a POC is closer than 25 feet to

another POC, when a POC is within 50 feet of an existing road, and when a POC falls within a gap area. In these cases the POC would be cut to reduce risk of spread of PL.

2.5.7 Cultural Resources

- If cultural resources are encountered during this project, all work in the vicinity would be stopped and the District Archaeologist would be notified.

CHAPTER III. AFFECTED ENVIRONMENT AND CHAPTER VI. ENVIRONMENTAL CONSEQUENCES

3.1 ANALYSIS BACKGROUND

This Chapter combines the affected-environment (typically EA Chapter 3) and effects-analysis discussion (Chapter 4) and has been arranged by specific resource values that may be affected. It identifies the direct, indirect, and cumulative environmental effects that may result from implementation of either of the two alternatives described in Chapter 2. It also addresses the interaction between the effects of the proposed thinning and density management with the current environmental baseline, describing effects that might be expected, how they would occur, and the incremental effects that could result. The description of the current conditions inherently includes and represents the cumulative effects of past and current land management activities undertaken by the BLM and private entities.

3.1.1 Reasonably Foreseeable Actions

Annual recurring activities are likely to occur within the project area. These include, but are not limited to, fire suppression activities, construction of roads across BLM land under existing right-of-way agreements, routine road maintenance, control of noxious weeds, and silvicultural activities in young stands.

The BLM currently is planning one regeneration harvest timber sale in the Sandy Creek drainage of the Middle Fork Coquille Watershed. The Proposed Project includes an estimated 200 acres of regeneration harvest on Matrix lands.

Proposed actions by the Coquille Tribe in the watershed include 3 timber sales in areas managed as Matrix, totaling roughly 350 acres. Approximately 170 acres are being harvested currently; the remaining 180 acres are in the layout phase. Harvest of all Coquille Tribal Forest lands managed similarly to federal Matrix allocations has been assumed in long-term modeling estimates of cover change.

The Roseburg BLM District recently published a FONSI for their Middle Fork Coquille 2007 Commercial Thinning and Density Management Environmental Assessment. Four Units would occur within an overlapping drainage of the Slater Rocks proposed action (the Bingham Creek 7th Field of the Camas Valley sub-watershed). These units, comprising of 82 acres of density management and commercial thinning, are planned as part of the Burma Triangle CT sale.

The USFS manages roughly 1,500 acres in the southern portion of the watershed. No USFS proposed actions are considered reasonably foreseeable; it is assumed that USFS Matrix holdings would be managed intensively and that reserved areas would undergo succession.

It is assumed private forests would be intensively managed on a 40 year harvest rotation.

3.1.2 Other Actions

The Western Oregon Plan Revisions, although reasonably foreseeable, are still in process and subject to change based on public comments and subsequent administrative remedies. They, therefore, provide insufficient information for meaningful consideration at this time (see *NAEC v. Kempthorne*, 457 F.3d 969, 979-80 (9th Cir. 2006) finding it lawful to consider the cumulative effects in the later broad-scale planning analysis).

It is not the intent of the planning or NEPA processes to recalibrate all analyses of existing plan implementation actions whenever a new planning effort begins consideration of a broad array of management guidelines and alternative allocations at the programmatic scale. Analyzing the outcome of the plan revision process as a “reasonably foreseeable future action” in every implementing project of the current plan would create a circular analysis process, where the effects of revising the plan would be used to determine whether to supplement the current plan’s analysis that is already being revisited in the revision effort. Rather, the plan-level EIS itself will factor in the cumulative program effects and reset the stage for analysis of subsequent plan implementation actions.

This also holds true for the Pacific Connector Gas Pipeline Project. A draft EIS is under development analyzing for a Liquid Natural Gas pipeline route from the proposed Jordan Cove Terminal in Coos Bay to Malin, Or. At the time of this writing, a course directly through one of the Slater Rocks Units (URC10) is the proposed route location. However, as no decision has been finalized on this project and this project is one of four being proposed, it is speculative to assess for impacts from a project that may or may not be implemented.

3.1.3 Cumulative Effects Considerations

The Council on Environmental Quality (CEQ) provided guidance on June 24, 2005, as to the extent to which agencies of the Federal government are required to analyze the environmental effects of past actions when describing the cumulative environmental effect of a proposed action in accordance with Section 102 of the National Environmental Policy Act (NEPA). CEQ noted the “[e]nvironmental analysis required under NEPA is forward-looking,” and “[r]eview of past actions is only required to the extent that this review informs agency decision making regarding the proposed action.” This is because a description of the current state of the environment inherently includes effects of past actions. Guidance further states that “[g]enerally, agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historic details of individual past actions.”

The information on individual past actions is merely subjective, and would not be an acceptable scientific method to illuminate or predict the direct or indirect effects of the action alternative. The basis for predicting the direct and indirect effects of the action alternative should be based on generally accepted scientific methods such as empirical research. The cumulative effects of this project upon the environment did not identify any need to exhaustively list individual past actions or analyze, compare, describe the environmental effects of individual past actions in order to complete an analysis which would be useful for illuminating or predicting the effects of the proposed action.

3.2 RESOURCES

3.2.1 Stand Condition

This project involves treatments in both the Matrix and Riparian Reserve land-use allocations. Treatments in the Riparian Reserves would differ from the Matrix by deliberately leaving high density areas and creating ¼-acre gap areas to promote variability in stand density. Legacy structures such as snags and down logs would be retained and created across both LUAs without preference. Stand density and stand structure will be used to describe the current and anticipated stand condition for both alternatives.

Table III-1: Summary of current stand conditions

EA Unit	Stand age	TPA >7"	BA/Ac	DBH	RD	Height/ Diameter	Vol./acre
SC13	46	261	212	12.2	61	77	32.4
SC14	43	254	179	11.3	53	79	23.5
SC16	40	227	167	11.6	49	85	25.7
SC17	45	197	172	12.6	48	82	29.0
SC18A	38	248	170	11.2	51	87	25.7
SC18B	49	227	198	12.6	56	80	32.9
TM02	37	270	204	11.8	59	66	21.8
URC01	49	195	218	14.3	58	71	41.4
URC02	64	216	270	15.1	69	69	57.8
URC02S	64	216	270	15.1	69	69	57.8
URC17	41	237	211	12.8	59	No Data	35.3
URC18	41	237	211	12.8	59	No Data	35.3
URC19	41	237	211	12.8	59	No Data	35.3
URC06	50	287	266	13.0	74	73	42.5
URC07	69	261	354	15.8	89	75	69.6
URC09E	42	273	216	12.0	62	73	29.2
URC09W	42	273	216	12.0	62	73	29.2
URC10	39	206	212	13.7	57	71	32.9
URC10N	49	276	290	13.9	78	71	43.5
URC11	35	181	167	13.0	46	71	21.4
URC12	30	304	227	11.7	66	71	27.8
URC13	59	213	258	14.9	67	68	44.2
SC06	35	265	222	12.4	63	75	28.1
SC07	39	214	201	13.1	56	66	28.0
SC07W	53	260	263	13.6	71	66	40.7
SC08	46	183	181	13.4	49	69	26.4
SC09	42	270	224	12.3	64	66	28.3
SC25N	52	156	205	15.5	52	74	39.5
SC25S	52	156	205	15.5	52	74	39.5
SC26	38	230	245	14.0	65	67	32.6
SC27	62	196	264	15.7	67	72	54.2
SC29	52	149	182	15.0	47	66	29.9
SC31	52	156	205	15.5	52	No Data	39.5
HMF02	37	243	190	12.0	55	72	26.0
HMF03	37	243	190	12.0	55	72	26.0
HMF04	39	167	183	14.1	49	74	29.6
HMF06A	40	240	239	13.5	65	84	39.1
HMF06XA	40	270	257	13.2	71	84	43.0
URC03	42	170	175	13.7	47	68	25.5
URC03N	42	170	175	13.7	47	68	25.5
URC04	62	169	225	15.6	57	69	54.4

EA Unit	Stand age	TPA >7"	BA/Ac	DBH	RD	Height/ Diameter	Vol./acre
URC04N	62	169	225	15.6	57	69	54.4
SC02	38	276	240	12.6	68	69	33.8
SC03	40	339	218	10.8	66	68	25.1
SC04	53	318	344	14.1	92	88	81.1
SC02S	59	243	272	14.3	72	No data	48.1
Average	46	229	222	13	61	73	36.8
Minimum	30	149	167	11	46	66	21.4
Maximum	69	339	354	16	92	88	81.1

3.2.1.1 Stand Density

The BLM manages approximately 16,854 forested acres in the analysis area. Approximately 14,556 acres are dominated by Douglas-fir or Douglas-fir with a western hemlock, Port-Orford cedar or grand fir component similar to the stands proposed for treatment. The remaining 2298 acres are a collection of mixed conifers, mixed conifers/hardwoods and mixed hardwoods. Because the forested area is extremely complex, a forest operations inventory (FOI) system is used to facilitate discussion and management decisions. This inventory describes forest cover (vegetation) and land use management attributes within areas greater than 5 acres in size of similar stand characteristics. These characteristics include site class, dominant species, understory species, treatments, age class, and stand condition. The classification system is a subjective interpretation from aerial photography of stand conditions at the landscape scale and ignores small dissimilarities.

Of the 14,556 acres of conifer-dominated stands within the analysis area, approximately 6711 acres are 30-70 years old in the “canopy closure/stem exclusion stage” of stand development (Franklin *et al.* 2002). Using the FOI classification system, approximately 66% of the 6711 acres of thinning-aged stands are classified as well stocked, 33% as medium stocked, and the remainder (1%) are described as poorly stocked.

Table III-2 depicts the range of plot level densities in the proposed treatment units. Note that the average across all plots is similar to the classification at the landscape scale. The plots are stratified into “no competition” (relative density less than 20), “low competition” (relative density from 21 to 34), “high competition” (relative density 35 to 55) and high competition transitioning to “imminent mortality” (relative density greater than 55).

Table III-2: Distribution of plot level (patch) Relative Density

Unit Number	Total plots	Average RD	Percent plots by relative density range			
			No competition: RD of 20 and less	Low competition: RD of 21 to 34	High competition: RD of 35 to 55	High competition transitioning to imminent mortality: RD 56 and greater
SC13	32	60	3%	0%	38%	59%
SC14	7	53	0%	0%	86%	14%
SC16	2	49	0%	0%	50%	50%
SC17	17	52	12%	0%	53%	35%
SC18	16	51	19%	0%	31%	50%

Unit Number	Total plots	Average RD	Percent plots by relative density range			
			No competition: RD of 20 and less	Low competition: RD of 21 to 34	High competition: RD of 35 to 55	High competition transitioning to imminent mortality: RD 56 and greater
TM02	10	60	0%	0%	20%	80%
URC01	5	55	20%	0%	20%	60%
URC02	14	68	7%	0%	14%	79%
URC06	40	73	10%	0%	20%	70%
URC07	6	90	0%	0%	0%	100%
URC09	17	60	6%	0%	47%	47%
URC10	40	57	8%	0%	38%	55%
URC11	5	46	20%	0%	60%	20%
URC12	6	66	0%	0%	17%	83%
URC13	7	67	0%	14%	14%	71%
SC06	8	60	0%	0%	50%	50%
SC07	6	55	0%	0%	33%	67%
SC08	12	49	25%	0%	50%	25%
SC09	12	64	0%	0%	33%	67%
SC25	8	52	13%	0%	50%	37%
SC26	7	65	0%	14%	0%	86%
SC27	14	69	0%	0%	36%	64%
SC29	3	36	67%	0%	33%	0%
HMF02	8	57	0%	0%	38%	62%
HMF04	10	48	0%	0%	80%	20%
HMF06	5	68	0%	0%	20%	80%
URC03	6	55	0%	0%	50%	50%
URC04	8	56	13%	0%	25%	62%
SC02	19	67	5%	0%	21%	74%
SC02S	16	70	6%	0%	13%	81%
SC03	10	65	0%	0%	20%	80%
SC04	7	91	0%	0%	0%	100%
Pre-treatment Average	383	59	7%	1%	33%	59%

* Individual plot information is unavailable for EA units URC 17, 18, 19, and SC31.

Relative density (RD) expresses the density of the trees relative to characteristics of stand development and processes. The correlation between relative density and stand condition is not exact with some of the variation attributable to light levels as influenced by topographic shading, average annual number of cloudy days, and distance from the equator (Lonsdale and Watkinson 1982). Western hemlock can grow to higher densities than Douglas-fir, hence the need for different relative density indices for the two species. A thorough discussion of relative densities is located in Section 2.3.1 of this EA.

Table III-3: Relative Density for Douglas-fir and western hemlock

Relative Density for Douglas-fir	Stand Condition for Douglas-fir	Relative Density for Hemlock (USDA, 2002)	Stand Condition for w. hemlock
15	Crown Closure	20	Crown Closure
25	On set of competition	35 and less	Individual tree growth is maximized
35	75% of full stand occupancy	35 - 50	Stand Vigor and Growth are maximized
40	Transition from low tree competition to high tree competition.	50 - 70	Transition from low tree competition to high tree competition.
55	Lower limit of self-thinning, transition into the zone of imminent mortality. Live crown ratio approximately 35-40%. Trees with small crowns will have a delayed response to thinning	70 and above	Lower limit of self-thinning, transition into the zone of imminent mortality
100	Theoretical maximum density	100	Theoretical maximum density

Because of strong winter storm winds and snowfall within the project area, the potential for windthrow and snow break damage acts as a constraint on the lower end of density treatment. Trees suddenly released from dense competition are more susceptible to windthrow and snow break because of the loss of adjacent trees to buffer the wind forces and because of the poor height to diameter ratios trees develop when grown at higher densities. Trees growing under intense competition are forced to grow taller in an effort to overtop adjacent trees and allocate energy towards height growth rather than diameter growth. This results in heights that are greater than open grown trees of the same diameter. This greater height to smaller diameter ratio makes trees more susceptible to bending or breaking under heavy wind or snow loads. Windthrow is greatest against a hard cut line, such as a change in ownership along a property line where a clear-cut has recently occurred and along topographic features where funneling of wind energy could occur. In an Olympic Peninsula study of wind damage after variable density thinning, Roberts and others (2007) found that wind was responsible for damaging approximately 1.8% of all trees with 80% of the damage being windthrow.

No Action

Approximately 1400 acres of overstocked stands would continue to decline in overall stand health and individual tree growth rate. Competition mortality would continue at increasing rates. Height to diameter ratios of the standing trees would continue to trend towards instability, increasing the wind-damage risk, and increasing the risk for patch or stand level mortality.

Stands in the project area would continue in their current development trajectory. Trees for future harvest would have low wood volumes and decreased values which would not meet the Matrix LUA objective of providing for forest products.

Retaining the higher stocking levels would retard attainment of the three functions of the Riparian Reserve that are contingent on the presence of large diameter trees: large wood delivery to streams, large wood delivery to riparian areas, and wildlife habitats (FEMAT 1993). It is expected that stands would continue through a series of suppression mortality stages before eventually developing habitat legacy components of large trees, snags, and coarse woody debris. A single story canopy with a narrow size and age range would

continue to dominate the stand. In the absence of disturbance, vertical stand complexity would remain relatively unchanged over the next several decades. Understory tree recruitment would be unlikely to occur for many decades. The herbaceous/shrub layer would show little development until such time that the stand opens up through competition or disturbance.

Stand projection simulations on the Coos Bay District suggest that it would take un-thinned stands roughly 200 years to produce large diameter forest structure associated with late-seral stands (USDI 2001). In contrast, Tappeiner *et al.* (1997) found that many Coast Range old-growth stands developed under low stocking densities and developed large diameter trees capable of providing large structure by the time those trees were 50 years-old.

Proposed Action

As described in Chapter II, the silvicultural prescription is to reduce the residual relative density to roughly 35 across all units while creating gaps and high density no-treatment areas within the Riparian Reserves. Down wood and snag creation (see Stand Structure discussion) would create additional tree density variation within the stands.

Residual densities at the stand scale after harvest are expected to range from 50-130 trees per acre. However, the variation introduced by variability at stand establishment, naturally occurring clustered mortality, windthrow damage, differential growth patterns, and logging-associated mortality would result in within-stand density variation. Densities at the individual ≈ 0.15 -acre plot/patch scale could range from 0 trees per acre in the gaps to over 400 trees per acre in the high density areas, depending on the unique characteristics at the plot/patch scale. Differing prescriptions applied to individual units and maintenance of untreated areas would maintain density variation at the landscape scale.

Examination of pre-treatment and post-treatment data from previous thinning projects illustrates the expected amount of within-stand density variability. Table III-4 is a summary of these data from three stands with a comparison to the proposed action. As indicated by the data, the relative density of roughly half the plots or patches within a stand corresponds to the average competition category of the stand as a whole. However, many other plots will have relative densities that are higher or lower than the stand average. There was no specific goal to achieve variability in these treated areas and a single Relative Density was the target. The proposed action is expected to be similar to the results depicted, with the following caveats:

- The addition of gaps prescribed in the Riparian Reserve (which did not occur in the depicted units) may result in more plots in the lower density range.
- The proposed creation of snags and down wood post harvest may also result in more plots in the lower density range, especially when snag and down wood creation is clumped, which would occur for about two thirds of the prescribed numbers (Table III-5) depending on a post-harvest assessment.

Table III-4: Comparison of pre and post thinning percent of plots (patches) by relative density range in typical thinning treatments on the Coos Bay District.

	Site name	Location	Stand Exam date	Total plots	Average RD	Percent plots by relative density range			
						No competition: RD of 20 and less	Low competition: RD of 21 to 34	High competition: RD of 35 to 55	High competition transitioning to imminent mortality: RD 56 and greater
Slater Rocks EA	Pre-treatment Average (See Table III-2) for unit level data)			383	60	7%	1%	33%	59%
Previous Sale Pre-treatment Data	Scare Ridge	Sec. 13, T.21S., R.09W.	1991	18	59	5.6%	16.7%	22.2%	55.6%
	Mose15	Sec. 15, T.21S., R.08W.	1994	21	49	4.8%	23.8%	38.1%	33.3%
	Soup Creek	Sec. 19 & 30, T.23S., R.09W.	1994	11	57	0.0%	18.2%	18.2%	63.6%
	Pretreatment Average					3.4%	19.6%	26.2%	50.8%
First Exam Post-treatment	Scare Ridge	Sec. 13, T.21S., R.09W.	1996	46	32	17.4%	45.7%	37.0%	0.0%
	Mose15	Sec. 15, T.21S., R.08W.	2002	27	30	22.2%	44.4%	33.3%	0.0%
	Soup Creek	Sec. 19 & 30, T.23S., R.09W.	1998	8	39	12.5%	25.0%	50.0%	12.5%
	Post-treatment Average					17.4%	38.4%	40.1%	4.2%

After treatment, the percentage of plots with relative densities below 20 increased roughly 5 times from 3.4% to over 17%. Areas at this low stocking level allow enough light into the stand to allow establishment of understory trees, provide for and maintain herb and shrub growth, allow retention of lower live branches, allow some epicormic branching, and maximize individual tree growth. Adding ¼-acre gaps to roughly 15% of the Riparian Reserve area in the proposed action would result in 67 acres falling into the “no competition” category. Approximately 45% of the post treatment plots had relative densities greater than 35, a 57% decrease from the pre-treatment plots. The amount of light reaching the forest floor under the trees in these plots is not enough to allow any but the most shade-tolerant plants to persist. While thinning increases the amount of light reaching into the canopy, the leave trees would recapture the growing space resulting in the resumption of the effects of overcrowding and density dependent mortality. Imposing a 50-foot no-harvest buffer along streams in the treatment units would yield roughly 167 acres of Riparian Reserve remaining in the “high competition” category.

Aside from the deliberate variations in Riparian Reserve density, variation introduced by naturally occurring clustered mortality, wind-throw damage, differential growth patterns, and logging-associated mortality would also result in within-stand density variation throughout the treatment areas.

Private timberlands of similar age in the analysis area are expected to have a similar level of stocking, where no intermediate treatments are conducted between stand establishment and final harvest (clear-cut) every 40-50 years.

By thinning the proposed units, stand densities would be reduced on 1400 acres (out of 6711) of the 30-70 year-old thinning aged class; coverage in stands at the highest densities class would be expected to decrease on 416 acres from 66% to 59%, coverage in medium density

would increase from 33% to 39%, and coverage in poor density would not change using the broad landscape classification (using the average post-treatment values).

The effects of the proposed action on stand densities would be insignificant at the landscape scale due to the limited scope of the project area and would be evident only at the local stand scale; this is consistent with the intent of creating stands that have variable densities and stand structure important to wildlife, while still maintaining adequate stand-level growth rates for timber production.

Through time, the treated stands would trend back towards the overstocked condition where individual patches would progress at different rates depending on conditions post harvest; however, density independent factors (disease, wind etc.) are expected to play a greater role as the stands develop towards mature forest (Franklin *et al.* 2002). Individual dominant trees would maintain higher growth rates and would be affected less by canopy closure at the stand level.

3.2.1.2 Stand Structure

Forest legacies such as remnant trees, snags, and down logs are valuable individual structural components that contribute to stand complexity and diversity. The following discussion is of the occurrence of these important elements within or near the treatment units.

Remnant trees occur within EA units URC02, URC06, URC07, URC13, SC25S, SC27, SC02, and SC04. Remnants are mature green trees that remain following the previous disturbance and are indicative of the original stand. They are generally greater than 28" in diameter, older than 100 years, singular in nature, and have crowns as much as 100' taller than surrounding stand. Remnants in Unit SC27 are currently being surveyed to established murrelet protocols along with the adjacent suitable habitat.

Snags and down wood can play a major role in the suitability of habitat for wildlife (Laudenslayer *et al.* 2002). Their importance was addressed in the RMP and research continues to show the value of this habitat component for many wildlife species and ecosystem functions. Dead wood (both standing and down) contributes to biological richness as substrate, cavity and forage sites, shelter and cover. In the Pacific Northwest, 69 vertebrate species commonly use cavities and 47 vertebrate species respond positively to down wood (Bunnell *et al.* 2002). Appropriate amounts of dead wood for managed forests continue to be debated due to data gaps concerning species needs and decay dynamics.

Snags

One hard snag per acre greater than 15 inches DBH and one-half snag per acre greater than 17 inches DBH are required to meet the 40% potential population level¹ of cavity nesting birds as required for harvest operations (USDI 1995). Large size classes are not always available in young stands.

Existing snags found in the proposed units are either small, hard snags resulting from recent mortality or larger snags resulting from past fire or harvest activities. There is an array of

¹ Sheridan, C. 2007. Unpublished data. Forest Ecologist, Coos Bay District BLM, 1300 Airport Lane, North Bend, OR 97459.

snag forms, ranging from soft snags devoid of most bark to hard snags with intact bark. Snag distribution and density are highly variable within units. Table III-5 lists estimated snag densities for snags ≥ 10 inches DBH and ≥ 10 feet tall recorded during stand exams. Numbers range from 0 to 28.7 per acre, with an average of 2.7 snags per acre for all units. Snags were found in roughly 40% of the units. EA units URC02, URC10, SC25, SC27, SC29, and URC04 are the only units where hard snags greater than 15 inches were recorded.

Table III-5: Snag densities in portions of stands including proposed units.

(Data is only for coniferous snags $>10''$ DBH and taller than 10 feet.)

Unit No.	Acres	Hard Snags/Acre (Decay Class 1-3)		Soft Snags/Acre (Decay Class 4-5)		Total Snags Per Acre
		10-15" DBH	> 15" DBH	10-15" DBH	> 15" DBH	
SC13	134	0	0	0	0	0
SC14	26	0	0	0	0	0
SC16	17	0	0	0	0	0
SC17	61	0	0	0	0	0
SC18A&B	53	1.9	0	0	0	1.9
TM02	52	0	0	0	0	0
URC01	18	0	0	0	0.2	0.2
URC02	54	7.7	0.1	0	0	7.8
URC 06	139	0	0	0	0	0
URC 07	15	0	0	0	0	0
URC 09E&W	69	0	0	0	0	0
URC10&10N	179	2.4	0.3	0	0	2.7
URC 11	25	0	0	0	0	0
URC 12	10	0	0	0	0	0
URC 13	19	6.2	0	0	0	6.2
SC06	33	0	0	0	0	0
SC07 & 7W	16	13.1	0	0	0	13.1
SC08A	19	0	0	0	0	0
SC09	48	0	0	0	0	0
SC25N & S	16	11.0	0.3	0	0	11.3
SC26	16	0	0	0	0	0
SC27	55	0	1.0	0	0	1.0
SC29	3	0	1.0	0	0	1.0
SC31	2	0	0	0	0	0
HMF02 & 3	27	0	0	0	0.3	0.3
HMF04	38	3.5	0	0	0	3.5
HMF06	16	7.5	0	0	0	7.5
HMF06A	7	0	0	0	0	0
URC03&3N	18	0	0	0	0	0
URC04 & 4N	25	19.8	6.7	0	2.2	28.7
SC02	77	0	0	0	0	0
SC03	43	4.3	0	0	0	4.3
SC04	25	0	0	0	0	0
SC02S	62	0	0	0	0	0
Averages		2.3	0.3	0.0	0.1	2.7

* No snag data available for units URC17, 18, 19.

Down Wood

The Coos Bay District RMP Management Actions/Directions do not require a specific amount of down wood in areas of partial harvest, but the same basic management direction is to be applied with modifications that reflect stand development. Existing large down wood within units is generally remnant from previous harvest, tends to be clumped near old landings, and is typically in soft decay classes (classes 4 and 5).

Down wood was surveyed during stand exams using line transects. Table III-6 lists estimates of the current lineal feet per acre of down wood for logs ≥ 5 inches diameter (at transect crossing) and at least 8 feet long. Data were recorded during stand exams for units or portions of units and are summarized as follows:

- Down wood in all decay classes, $\geq 16''$ diameter at large end and $\geq 8'$ long, ranges from 0 to 3,613 with an average of 966 lineal feet per acre.
- Roughly 38% of the units contain ROD compliant down wood (decay classes 1 & 2, $\geq 16''$ diameter large end, and $\geq 16'$ long). The remaining units had no ROD compliant down wood identified during transect surveys.

Table III-6: Down wood levels in proposed Slater Rocks thinning units.

*Unit / Transect No.	Total Hard & Soft Down Wood (lineal feet per acre) (Decay Classes 1-5; $\geq 16''$ long)		ROD Compliant Down Wood (lineal feet per acre) (Decay Classes 1-2; $\geq 16'$ long $\geq 16''$ dia. at large end)
	4-15'' dia. at large end	$\geq 16''$ dia. at large end	
SC13	766	327	0
SC14	97	97	0
SC16	456	456	0
SC17	563	843	0
SC18A&B	298	681	85.5
TM02	52	104	0
URC01	3830	544	0
URC02	1368	1363	97.7
URC17*	0	0	0
URC18*	0	0	0
URC19*	0	0	0
URC 06	1008	2033	34.2
URC 07	1596	1140	0
URC 09E&W	1730	642	0
URC10&10N	734	1179	17.1
URC 11	3146	272	0
URC 12	342	228	0
URC 13	2052	3028	0
SC06	940	425	0
SC07 & 7W	798	456	0
SC08A	1026	570	0
SC09	456	513	57
SC25N & S	940	939	171.1
SC26	488	1659	0
SC27	1221	1072	342.1
SC29*	0	0	0
SC31	940	939	171.1
HMF02 & 3	427	170	0
HMF04	409	136	0
HMF06	2665	2534	136.8
URC03&3N	1172	681	0
URC04 & 4N	1538	1195	85.5
SC02	1008	1332	0
SC03	682	681	0
SC04	2149	3613	195.5
SC02S	1624	1065	171.1
Averages	1141	966	

* No CWD data available

No Action

The current trajectory of snag and down wood development would continue throughout the treatment areas where snags and down wood recruitment would primarily originate from the smallest suppressed trees. As suppression mortality continues, there would be an increase in species associated with this habitat as snags and down wood become available.

Pileated woodpeckers and other primary cavity excavators utilize a variety of snag sizes for foraging, but prefer larger snags (≥ 26 " DBH) for nesting and roosting. Most of the snags and coarse wood in the project area would provide foraging substrate, and would provide nesting and roosting habitat for smaller cavity nesting species. Longevity of the snags and down wood from the smaller diameter classes would be 10 to 20 years due to the rapid rate of decay associated with small wood.

Proposed Action

Thinning the proposed stands would accelerate the development of large trees. Large trees in the Riparian Reserve provide important structure for a variety of plant and animal species and, ultimately, are recruited into large snags and down wood. Larger trees within the Matrix yield greater wood volume and higher value logs available for meeting the ASQ commitment.

Existing snags and large down wood (> 8 " diameter large end) would be protected to the greatest extent possible. Some older soft snags and logs would be degraded (cut, knocked over, or smashed) through harvest activities or cut for safety reasons. Trees felled for yarding corridors within the no-harvest buffers of Riparian Reserves would remain on-site as down wood. Overall, there would be an increase in hard snags and down wood (decay classes 1, 2, 3) and a decrease in soft snags and down wood (decay classes 4, 5) following harvest.

Harvest activities would inadvertently create some immediate hard snags and down wood through injury and breakage. One study found 0.16 snags > 20 " DBH were created following group selection harvest methods (Walter and Maguire 2005). Another study found that after 1-10 years, 13% of the residual trees in a tree-retention harvest of mature forest in the Cascade Range of Oregon had become snags (12" and greater) by natural processes (Busby *et al.* 2006). Snag data gathered on District in similar stands post-thinning showed an average of 14 hard snags per acre (range 0-39). Data were collected on snags greater than 5.9" DBH and 6' tall². No pre-thinning data was available for comparison.

Snag and down wood creation would occur in units where it is warranted. An effort would be made to balance creating small (< 17 " DBH) snags immediately versus growing large trees more quickly to provide future larger snags and down wood. In stands where at least one-third of the leave trees would be ≥ 16 " DBH (for snag creation) or ≥ 18 " (for large down wood creation), snags and down wood would be created if the pre-harvest unit does not meet ROD direction or is not expected to meet ROD direction post-harvest. Table III-7 summarizes the percentage of the residual stand exceeding the diameter thresholds for snags

² Fontaine, P. 2007. Unpublished data. Forester, Coos Bay District BLM, 1300 Airport Lane, North Bend, OR 97459.

and down wood. Tree diameters were obtained from stand exam information. Table III-7 also indicates whether the unit currently meets ROD direction for snags and down wood, and whether snag and/or down wood creation appears warranted based on that data. Factors such as tree species and destruction of snags and down wood during harvest operations would also be considered prior to snag and/or down wood creation.

Table III-7: Snag and down wood creation parameters for proposed units.

Pre-harvest ROD compliance within units and DBH of leave trees at the 66th percentile (threshold for snag creation is $\geq 16''$ DBH and for down wood creation is $\geq 18''$ DBH).

Unit No.	ROD Compliant Snags (snags/acre) ($\geq 10''$ DBH, $\geq 10'$ tall, all decay classes)			ROD Compliant Down Wood (lineal ft/acre) (Decay classes 1-2; $\geq 16'$ long $\geq 16''$ dia.)	Estimated DBH at 66 th percentile of leave trees	Snag/CWD Creation Code*
	10-15'' DBH	> 15'' DBH	Total			
SC13	0	0	0	0	14''	0/No
SC14	0	0	0	0	14''	0/No
SC16	0	0	0	0	15''	0/No
SC17	0	0	0	0	15''	0/No
SC18A	1.9	0	1.9	85.5	13''	0/No
SC18B					14''	0/No
TM02	0	0	0	0	14''	0/No
URC01	0	0	0.2	0	20''	4/Snags/DW
URC02 & 02S	7.7	0.1	7.8	97.7	20''	3/DW
URC17	0	0	0	0	16''	2/Snags
URC18	0	0	0	0	16''	2/Snags
URC19	0	0	0	0	16''	2/Snags
URC 06	0	0	0	34.2	17''	2/Snags
URC 07	0	0	0	0	20''	4/Snags/DW
URC 09E&W	0	0	0	0	16''	2/Snags
URC10	2.4	0.3	2.7	17.1	17''	0/No
URC10N					14''	0/No
URC 11	0	0	0	0	14''	0/No
URC 12	0	0	0	0	16''	2/Snags
URC 13	6.2	0	6.2	0	20''	3/DW
SC06	0	0	0	0	15''	0/No
SC07	13.1	0	13.1	0	17''	0/No
SC07W					19''	3/DW
SC08A	0	0	0	0	17''	2/Snags
SC09	0	0	0	57	16''	2/Snags
SC25N & S	11.0	0.3	11.3	171.1	20''	2/Snags
SC26	0	0	0	0	16''	2/Snags
SC27	0	1.0	1.0	342.1	20''	2/Snags
SC29	0	1.0	1.0	0	14''	0/No
SC31	11.0	0.3	11.3	171.1	20''	0/No
HMF02 & 3	0	0	0.3	0	15''	0/No
HMF04	3.5	0	3.5	0	18''	3/DW
HMF06	7.5	0	7.5	136.8	17''	2/Snags
HMF06A	0	0	0	0	16''	2/Snags
URC03&3N	0	0	0	0	16''	2/Snags
URC04 & 4N	19.8	6.7	26.5	85.5	20''	3/DW
SC02	0	0	0	0	16''	2/Snags
SC03	4.3	0	4.3	0	14''	0/No
SC04	0	0	0	195.5	20''	2/Snags
SC02S	0	0	0	171.1	20''	2/Snags

* Snag/down wood creation codes:

0/No – Minimum DBH ($\geq 16''$ DBH) at 66th percentile is not met.

2/Snags – Snag creation recommended – DBH at 66th percentile is $\geq 16''$ DBH **and** unit is not ROD compliant for snags.
3/DW – Down wood creation recommended – DBH at 66th percentile is $\geq 18''$ DBH **and** unit is not ROD compliant in down wood but is ROD compliant for snags pre-harvest.

4/Snags/DW - Snag and down wood creation recommended – Greater than 1/3 of residual TPA exceeds DBH thresholds **and** units are not ROD compliant for snags or down wood.

3.2.2 Wildlife

This analysis area falls within the Coast Range and the Klamath Mountains Physiographic Provinces and occurs within sub-watersheds of the Middle Fork Coquille River 5th-field watershed. This assessment addresses federal lands in portions of the following 6th-field sub-watersheds:

- The Upper Rock Creek 6th-field sub-watershed;
- The Slater Creek 6th-field sub-watershed;
- The Twelve Mile Creek 6th-field sub-watershed - only that portion within the Coos Bay District;
- The Headwaters Middle Fork Coquille River 6th-field sub-watershed - only that portion within the Coos Bay District.

This analysis area was chosen to reflect the mobile nature of many wildlife species, and because it closely matches the forest ecosystem and land management patterns of the project area. Analysis will occur at the site level (proposed project units) as well.

3.2.2.1 Marbled Murrelet

Declining population was the primary reason for listing the Marbled Murrelet (*Brachyramphus marmoratus*) as threatened in 1992 under the ESA (57 FR 45328). The Marbled Murrelet Recovery Plan identified the primary threats to the species as: 1) predation; 2) loss of nesting habitat; 3) by-catch in gill-nets; and 4) oil pollution from both chronic and major spills.

At-sea surveys are used to monitor murrelet populations in each of the 5 murrelet conservation zones. The analysis area is within Zone 4, and population densities have declined since 2002, with rising and falling modulations (Huff *et al.* 2006). This is not a statistically valid trend, but the population density in Zone 4 of 3.14 birds per square kilometer for 2005 is below the 2002 benchmark of 4.21 birds per square kilometer.

Murrelet suitable habitat and occupied sites generally contain trees greater than 18 inches DBH, multi-storied canopies with moderate closure, sufficient limb size and substrate (moss, duff, etc.) to support nest cups, flight accessibility, and protective cover (Burger 2001, Nelson and Wilson 2002).

Suitable habitat within 35 miles of the coast (Zone 1) has a higher likelihood of occupancy because access to the ocean for foraging is easier. All units are located 28 to 35 miles from the Pacific Ocean.

Table III-8: Summary of murrelet habitats within the project area

	Analysis Area	Proposed Units	Adjacent to Proposed Units
Suitable Habitat	4,040 acres – BLM managed (24% of all BLM acres)	None	URC -02,02S,03,04,06,07,17,18,19 HMF -02,03,04,06 SC -06,07,08,09,18,21,22,25S,25N,26,27,29,31 TM -02
Occupied Sites	2 known	None	URC 09,09E,10
Critical Habitat	3,513 acres	None	URC 07,10N; HMF 02

No Action

For those stands within the Riparian Reserve, development of larger trees with potential nesting structure would be delayed. The stand development trajectory would remain different from that which occurred in most stands that currently provide suitable habitat.

Proposed Action

The proposed action would cause no immediate measurable effects to marbled murrelets because no suitable nesting habitat would be removed.

There is a potential of noise disturbance to nesting murrelets if thinning (commercial and density management) were to occur during the breeding season (1 April to 15 September). Noises above ambient levels would occur from chainsaw use; human voices and use of small hand tools are generally not above levels that cause disturbance.

Noises associated with the proposed actions could disturb nesting murrelets and negatively affect productivity. Although little detailed information is available concerning the vulnerability of murrelets to disturbance effects, research on a variety of other bird species suggest such effects are possible (Henson and Grant 1991). Studies have shown that disturbance can affect productivity by nest abandonment, egg and hatchling mortality due to exposure and predation, longer periods of incubation, premature fledgling or nest evacuation, depressed feeding rates of adults and offspring, reduced body mass or slower growth of nestlings, and avoidance of otherwise suitable habitat.

Twenty-nine (70%) of the 42 proposed thinning units have adjacent suitable habitat within the 100 yard disturbance zone for the murrelet. The area of disturbance relative to the 29 units ranges from 1 to 21 acres, with a total of 200 acres. Units **URC**09E, **URC**09W, and **URC**10 are adjacent to an occupied site and are included in the 200 acres of potential disturbance acres. Of the 200 acres of suitable habitat, 62 acres (31%) will have two years of protocol surveys completed prior to harvest to determine occupancy status of these adjacent stands. These are: Units **URC** 02, 02S; Units **HMF** 03, 04, 06; and **SC** 08, 18, and 27. If birds are detected, applicable Terms and Conditions of the Biological Opinion would be implemented to lessen noise disturbance.

Based on previous surveys, it is unlikely murrelets would be found with these current surveys. From 1994 through 1997 BLM conducted 166 intensive protocol surveys, mainly in

the Rock Creek portion of the analysis area. No murrelets were detected during those surveys.

The following units have a combined total 98 acres unsurveyed suitable habitat within the 100-yard disturbance zone: URC 03, 04, 06, 07, 09E, 09W, 10, 10N, 17, 18, 19; HMF 02; SC 06, 07, 09, 25N, 25S, 26, 29, 31; TM02. These units will not be surveyed prior to harvest. Daily operating restrictions would be in effect for these units. These units have been included in the Biological Assessment; applicable Terms and Conditions of the Biological Opinion would be implemented to lessen noise disturbance.

Units URC 09E, 09W, and 10 are adjacent to occupied habitat. The total acreage from the three units within the disturbance threshold is 40 acres. Daily operating restrictions would be in effect and these units are also included in the Biological Assessment; if any other Terms and Conditions are contained within the Biological Opinion, then they would also be applied.

The potential effect to nesting murrelets is anticipated to be minimal due to timing restrictions and the nature of the adjacent suitable habitat. Implementation of daily operating restrictions and the varying implementation dates of harvest minimize the noise disturbance to nesting murrelets and the potential for disruption of adults when visiting the nest to feed offspring. As mentioned above, the size of the unsurveyed suitable habitat being affected ranges from 1 to 21 acres with the total acreage being 98. Surveyed occupied habitat ranges from 9 to 16 acres with a total of 40. These areas are not concentrated close together, but are dispersed across the approximately 17,000-acre analysis area. In addition, murrelets prefer nest trees in stands which contain hiding cover as nest sites near stand edges are not usually successful (Grenier and Nelson 1995).

3.2.2.2 Northern Spotted Owl

The northern spotted owl (*Strix occidentalis caurina*) was listed as federally threatened in 1990 (55 FR 26114) because of declining populations and decreases in suitable nesting habitat.

The forested areas within the project units are spotted owl dispersal habitat, but much of it is poor quality because of small tree size, dense stocking levels, and low levels of snags and down wood. Dispersal habitat is generally forests greater than 40 years of age with <40% canopy cover, which offers cover from predators, some foraging opportunities, and adequate space for flying.

In the Oregon Coast Range and Klamath Provinces, old-growth forest was the only forest type used for roosting and foraging in greater proportion than its availability at the landscape scale (Carey *et al.* 1992). However, at a finer scale, owls used portions of young forests for foraging in greater proportion than its availability, especially where wood rats were present. In the Western Cascades of Oregon, 50 percent of spotted owl nests were in late-seral/old-growth stands and none were found in stands less than 40 years old (Irwin *et al.* 2000). Spotted owls do not generally appear to select stands of intermediate or younger ages (Solis and Gutierrez 1990).

Stand characteristics which spotted owls rely on include: a multi-layered, multi-species canopy dominated by large overstory trees; moderate to high canopy closure; a high incidence of trees with large cavities and other types of deformities; numerous large snags; an abundance of large, dead wood on the ground; and open space within and below the upper canopy for spotted owls to fly (Thomas *et al.* 1990).

Table III-9: Summary of NSO habitats within the project area

	Analysis Area	Proposed Units	Adjacent to Proposed Units
Suitable Dispersal Habitat	11,584 acres – BLM managed (69% of all BLM acres)	987 acres	Yes
Suitable NRF Habitat	5830 acres – BLM managed (34% of all BLM acres)	None	Yes
Critical Habitat	1,108 acres	None	URC10N
Occupied nest site/Activity Center	7 known sites, 3 with alternates	None	SC27, HMF06

No Action

For those stands within the Riparian Reserve, development of larger trees with potential nesting, roosting, and foraging structures would be delayed. The stand development trajectory would remain different from that which occurred in most stands that currently provide these habitats.

Proposed Action

The proposed action would cause no immediate measurable effects to northern spotted owls because no suitable nesting habitat would be removed. No suitable nesting, roosting, or foraging habitat would be altered or removed.

Disturbance to nesting spotted owls is a concern when noises associated with timber harvest occur during the owl nesting season (March 1 – September 30) within 65 yards of a known spotted owl nest site or activity center. Noise disturbances above normal ambient levels may affect breeding, feeding or sheltering behavior.

There are two spotted owl site centers within 65 yards of two proposed thinning units (Units SC27 and HMF06). For these two units, protocol guidelines would be followed to determine nesting status for these areas. This consists of two surveys (visits) between April 1 and June 1. If birds are determined not to be nesting, harvest operations would be implemented without restrictions. If birds are found, operations would be subject to the Terms and Conditions of the Biological Opinion. These would likely include postponing the onset of harvest operations until owlets have fledged. Once capable of sustained flight, young owls are presumably able to distance themselves from disturbance and minimize their risk of predation.

Thinning of the existing forest would accelerate the development of suitable nesting, roosting, and foraging habitat for the spotted owl within the project area Riparian Reserves. Recruitment of large snags and down logs would also be accelerated, which is especially beneficial to the spotted owl and their prey species. Some snags would be intentionally

created and as the result of mortality through the thinning process. Some loss or degradation of existing snags and down wood from harvest activities is anticipated, but all wood would be left on-site to continue to provide habitat for owl prey-based species.

- 987 acres of dispersal habitat would be altered, but remain functional, with this alternative. This is because canopy cover would remain above 60% within thinned units.
- Up to 15 acres of dispersal habitat would be removed for road construction and renovation.
- No suitable owl nesting, roosting, and foraging habitat would be altered or removed.
- 447 acres within the Riparian Reserve would be placed on a trajectory for future suitable habitat.

3.2.2.3 Other Special Status Species

Instruction Memorandum No. OR-2008-038, transmitted 2/07/2008, updated the State Director's special status species list for the Oregon/Washington BLM. The new list contains two categories of special status species: Sensitive and Strategic. Strategic Species do not require NEPA analysis. Species listed as threatened or endangered in the ESA are also considered Special Status Species.

Conservation assessments have been written for a portion of the Special Status wildlife species, but there is limited knowledge of the distribution, abundance, and life history of a majority of the Bureau Sensitive wildlife species. Participation in regional monitoring programs has increased our understanding of some wildlife species (bald eagles, peregrine falcons, bats, mollusks, fisher, and butterflies). Project area surveys for Bureau Sensitive wildlife species are conducted as part of general wildlife surveys and are usually neither intensive nor to established protocols. This analysis describes potential effects based on the current knowledge of the target species, knowledge of similar species, and on habitat correlates.

Bald Eagle

The final ruling to remove the bald eagle (*Haliaeetus leucocephalus*) from the Federal List of Endangered and Threatened Wildlife was effective 8 August 2007 (72 FR 37345). Protections remain in place under the Bald and Golden Eagle Protection Act (BGEPA) and the Migratory Bird Treaty Act (MBTA). Population declines at the time of listing were the result of environmental contaminants, habitat destruction, a declining food base, disturbance, electrocution, and intentional killing.

Bald eagles nest in mature or old-growth trees, snags, cliffs and on man-made structures. Nests typically include at least one perch with a clear view of water (USDI 2007b). In Oregon, bald eagles nest within 4.5 miles of a major water body, although most are within one mile (Isaacs *et al.* 1983). Patches of suitable habitat exist along and upslope from the Middle Fork Coquille River.

Although there are no confirmed bald eagle nests in the Middle Fork Coquille Watershed, frequent sightings during summer 2007 indicate the possibility of a nest site somewhere in the area. Currently the closest known active bald eagle nest is located outside the watershed

approximately 13 miles southwest. There is another nest (abandoned in the early 1990s) located in the adjoining watershed (East Fork Coquille) over six miles northeast. Bald eagles are regularly seen in the area upriver of the abandoned site but no new nest has been located. The BLM cooperates in a state-wide monitoring of bald eagle nests, and staff biologists survey known nest sites annually and conduct surveys in proposed project areas. There are currently an estimated 27 bald eagle nest sites (territories) within the boundaries of the Coos Bay District. Eight of those are located on BLM-administered lands.

No Action

For those stands within the Riparian Reserve, development of larger trees with potential nesting and roosting structures would be delayed. The stand development trajectory would remain different from that which occurred in most stands that currently provide these habitats.

Proposed Action

The proposed action would cause no measurable effects to bald eagles as there are no known bald eagle nests or habitat within the analysis area.

American Peregrine Falcon

American peregrine falcons (*Falco peregrinus anatum*) were de-listed from threatened status by the USFWS in 1999 (64 FR 46541) in the lower 48 states and removed from the Oregon State threatened and endangered species list in April 2007. Population declines at the time of listing were mainly the result of environmental contaminants.

The proposed units contain no peregrine habitat and there are no documented peregrine falcon eyries (nest sites) in Middle Fork Coquille Watershed, although there are a number of potential cliffs within the Watershed. The BLM cooperates in a state-wide monitoring of peregrine sites. Staff biologists survey known nest sites annually and periodically conduct surveys in proposed project areas with cliffs. New sites are added to the annual survey program. The 2007 monitoring results suggest that the population of peregrines nesting in Oregon is stable or increasing. There are currently an estimated 19 peregrine sites within the boundaries of the Coos Bay District. Two of those are located on BLM-administered lands.

No Action/Proposed Action

Neither action would cause effects to peregrine falcons because no cliff habitat exists within or directly adjacent to the thinning units.

Fisher

Fisher presence in the analysis area is highly unlikely. The dispersal habitat in the analysis area is low quality based on the overall low number of snags, down wood and fragmented late-successional habitat.

In 2004, the west coast population segment of the fisher (*Martes pennanti*) was found to be warranted for listing under the ESA (69 FR 18769). However, listing was precluded by other listing activities of greater priority, and the species was subsequently placed on the federal list of candidates.

Historically on the west coast, fishers were most abundant in low to mid-elevation, conifer-dominated forests with relatively continuous canopies and complex physical structure near the forest floor (Aubry and Lewis 2003). The presence of large conifers and hardwoods is a significant predictor of fisher occurrence (Campbell *et al.* 2000). However, low densities of fishers have been associated with second-growth forests and fragmented landscapes (Aubry and Lewis 2003). Fishers generally avoid clearcuts, stands with less than 40% canopy cover, and openings more than 25 meters across. The average home range of male fishers is about 10,000 acres, nearly three times the size of female home ranges that are 3,705 acres on average (Powell and Zielinski 1994). Fishers are difficult to detect because of their large home ranges, low densities and elusive behavior.

On a landscape scale, patches of preferred habitat and open areas in relation to these patches may be critical to the distribution and abundance of fishers (Campbell *et al.* 2000). Patches separated by large open areas are not likely to be used (Buskirk and Powell 1994). Riparian areas are important to fishers, especially for resting sites and prey availability. Riparian corridors and forest saddles between drainages may provide important dispersal habitat and landscape linkages (Campbell *et al.* 2000). Powell and Zielinski (1994) suggested that suitable resting and denning sites may be more limiting on the landscape. Both live trees and large snags (47 inch average) provide resting structure for fishers (Zielinski *et al.* 2004).

There are two known small, disjunct populations in Oregon: an indigenous population in the Siskiyou Mountains and a reintroduced population in the southern Cascades (Aubry and Lewis 2003). BLM biologists conducted surveys for marten and fisher in the Coquille, Umpqua and N. Fork Chetco river drainages from 1994 to 1997. No martens or fishers were detected. Definitive conclusions can not be made because few data points were taken. Protocol surveys were conducted in 2005-06 north of the analysis area in LSR 261 (T26S R10W and T27S R10W). No fishers or martens were detected. Recent fisher surveys conducted on district lands in 2006-07 near the California border detected two fishers. In 1991, two BLM staff reported incidental sightings near Middle Creek and Daniel's Creek. It is possible that fishers are elsewhere on district. However, there is no documentation of fisher presence in the analysis area.

No Action

Habitat conditions within the area would continue upon current trajectories, remaining poor for fisher presence.

Proposed Action

The proposed action is not expected to have an effect on the fisher because of the unlikelihood of their being present within the project area. Development of enhanced stand structures and creation of down logs would increase the quality of habitats, but it is still unlikely it would be utilized by fishers.

Foothill Yellow-legged Frog

This species has been documented in the Middle Fork Coquille Watershed although there are no records for the analysis area. Because perennial streams bisect or are adjacent to units in many areas, the yellow-legged frog (*Rana boylei*) could be present in thinning units.

Yellow-legged frogs require partially shaded (20%) permanent (and some types of intermittent), low-gradient, medium size streams (4th-6th order). The Conservation Assessment states that adults are not usually found in streams with moderately high or high overhanging vegetation or shade; it is hypothesized the frogs need direct sunlight for basking (Olson and Davis 2007). They also use streams that are reduced to waterholes connected by trickles during the dry season (Nussbaum *et al.* 1983); however, they are less abundant than in mid-sized streams (Applegarth 1994a). Newly transformed juveniles migrate upstream during fall and winter (Applegarth 1994b). Breeding and egg-laying generally occurs during the spring in streams and rivers. Once considered abundant in southwestern Oregon, some populations appear to be greatly reduced. Contributing factors for decline include habitat alteration, airborne agrochemicals, and/or effects of exotic species (NatureServe 2008). Peak flow changes, generally associated with water impoundments, appear to also be a major threat (Olson and Davis 2007). Some sedimentation may be beneficial in small amounts by making egg masses less conspicuous to predators (AmphibiaWeb 2008), but too much fine sedimentation can embed stream substrates and interstitial spaces (Olson and Davis 2007).

The yellow-legged frog could be present in streams within thinning units or in streams adjacent to units, but it is highly unlikely because all of these streams are small and have little sun. None of these streams provide egg-laying habitat.

No Action

Current aquatic conditions would continue. Incidental sightings of the yellow-legged frog would be recorded.

Proposed Action

Project design features have been incorporated to ensure the persistence of this species across the landscape. These include no-harvest buffers on streams containing potential yellow-legged frog habitat, sediment barriers and catch basins, and seasonal restrictions. Design features have been incorporated to protect all aquatic species, including fish and macro invertebrates. Any sediment that may be generated from road associated activities would be mobilized during the first heavy winter rains which does not coincide with the egg-laying and larval stages of this frog. Finally, there would be no changes to peak flows within the watershed through implementation of the proposed project as thinnings of this design have shown no net effect to peak flows. This project would not contribute to the need to list this species under the Endangered Species Act.

Northwestern Pond Turtle

This species has been documented in the Middle Fork Coquille Watershed and there is one record for the analysis area located in the lower reaches of Rock Creek. This turtle (*Clemmys marmorata marmorata*) is rare throughout the District.

The Northwestern pond turtle inhabits marshes, sloughs, moderately deep ponds, and slow-moving portions of creeks and rivers. It requires basking sites such as partially submerged logs, mats of vegetation, and rocks (Nussbaum *et al.* 1983). Nest sites are in open areas with a clay soil component, usually within 100m of water and usually in a southern exposure (Rathburn *et al.* 1992). Threats include predation on hatchlings (by bullfrogs, bass, and other exotic species), flood control, habitat loss, illegal collection, and death on roads.

No Action

Current aquatic conditions would continue. Incidental sightings of the Northwestern pond turtle would be recorded.

Proposed Action

The implementation of PDFs and BMPs to arrest sediment delivery to streams would prevent downstream impacts to turtle habitat. Also, because there is no habitat within the treatment areas (no ponds, no basking sites, no non-forested fields nearby for nesting), the proposed action is not expected to have an effect on the Northwestern pond turtle.

Others

There are no known caves, mines, or abandoned bridges or buildings within the project area. They are known bat roosts. No other known sites of any Special Status wildlife species occur within the proposed units.

3.2.2.4 Migratory Birds

Executive Order 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds* (66 FR 3853), of January 17, 2001, directs federal agencies to conserve migratory birds to meet obligations under the migratory bird conventions and the Migratory Bird Treaty Act. Interim management guidance is provided by BLM Instruction Memorandum No. 2008-050, dated 18 December 2007. This guidance establishes a consistent approach to project level analysis until a Memorandum of Understanding (MOU) is established with the U.S. Fish and Wildlife Service. Western birds on the U.S. Fish and Wildlife Services' *Bird Species of Conservation Concern* and *Game Birds below Desired Condition* are to be addressed when actions could potentially affect those species. These lists are based primarily on North American breeding bird survey data which can be accessed at <http://www.mbr-pwrc.usgs.gov/bbs/> (Sauer *et al.* 2007). The following species are on one of these lists, could be affected by this project, and have not already been addressed elsewhere in this EA (as T&E or Bureau sensitive species): northern goshawk, olive-sided flycatcher, rufous hummingbird, mourning dove, band-tailed pigeon, and the blue-throated grey warbler.

Northern goshawks are associated with late-seral stands, and at least three sightings have been documented in the Middle Fork Coquille watershed. Because thinned stands in the Riparian Reserve are expected to achieve old-growth structure sooner than unthinned stands (Bailey *et al.* 1998, Bailey and Tappeiner 1998), thinning is likely to benefit this species over the long term.

The olive-sided flycatcher is associated with conifer forest, especially where burns have left scattered large snags and live trees. It is unclear why this species is declining in an era of

increasingly fragmented forests when it prefers edge habitat, but some types of harvested forests could be acting as “ecological traps” where nesting success is poor. However, in one study, this species responded positively to thinning, possibly because thinning creates the uneven canopy needed for foraging (Hagar and Howlin 2001).

Reasons for population declines in the rufous hummingbird are unclear. This species was one of a group of Neotropical birds that did not respond to thinning as a whole (Hagar and Howlin 2001). Because rufous hummingbirds seem to prefer a high canopy and well-developed understory for breeding (Patterson 2003,2006), they would likely benefit from thinning over the long term, as thinning would increase light to the understory, thus increasing nectar availability.

Both the mourning dove and band-tailed pigeon are currently game birds in all of Oregon (see: [Oregon Game Bird Regulations](#)). Both species are common in western Oregon despite population declines overall. Mourning doves are thought to be currently more numerous than prior to European settlement because of agricultural practices and forest clearing (Kindschy and Marshall 2003,2006). They are nest generalists and will nest on the ground when trees are not available. Band-tailed pigeons nest in closed-canopy forest and forage in open-canopy (Sanders 1999). Thinning young forest is likely to benefit both species overall.

In southwest Oregon, black-throated gray warblers are common in mature chaparral which includes a mixture of oak, madrone, and manzanita. They also frequently reside in early-seral habitats and forests which are a mixture of Oregon white oak and conifer (Janes 2003,2006). Habitat is not optimal however, so the warbler would likely be in low numbers and transient rather than nesting, so direct effects from thinning would be insignificant.

The proposed action represents a net benefit to land birds, at least in the short-term (10 years). Canopy closure in the treated stands is expected to return to pre-project levels within 10-15 years.

3.2.3 Water Resources

The proposed treatment units are located in the 309 square mile, Middle Fork Coquille River Watershed. Watershed is defined as the 5th field hydrologic unit level. Sub-watershed refers to a 6th field hydrologic unit which varies from about 28-34 square miles for the affected sub-watersheds. Drainage refers to a 7th field hydrologic unit which varies from about 10-17 square miles for the affected drainages. In portions of this analysis, the smaller sub-watershed and drainage scales are used to better detect potential effects of the project near the site of proposed actions. The rationale is that adverse (or beneficial) effects to water resources are easier to detect in smaller catchments (Bosch and Hewlett 1982) as one nears the treatment site. Table 1 below shows the location and scale of the project by catchment. The majority of treatment acres are located in the Upper Rock Creek and Slater Creek Sub-watersheds. Together, the two sub-watersheds and two drainages comprise the analysis area (see Map 1).

Table III-10: Hydrologic Analysis area by Sub-watershed or Drainage

Watershed (5 th field)	Sub-watershed (6 th field)	Area* (mi ²)	Acres*	Treatment Acres*	Percent of Sub-watershed/Drainage
Middle Fork Coquille River	Upper Rock Creek	28.7	18,340	552	3.0
	Slater Creek	33.6	21,510	675	3.1
	Drainage (7th field)				
	Bingham Creek	17.1	10,960	125	1.1
	Upper Twelve Mile Creek	10.4	6,680	30	0.4
Totals		89.8	57,490	1382	2.4

*Approximate values based on GIS data

3.2.3.1 Stream Flow

Studies have found that higher than normal peak flows can occur as a result of timber harvest in the TSZ (Harr and Coffin 1992). Harvest in the TSZ can provide openings where snow accumulates. Warm winds and/or rain-on-snow events can melt this increased snow pack rapidly and create higher than normal flows.

Roads have the potential to increase peak flows (Beschta 1978, Wemple et al. 1996). Mid-slope roads can intercept surface and subsurface water and divert it into the road drainage system. This can effectively extend the stream channel network and speed up delivery of water to streams. Most roads in the analysis area are mid-slope roads and many of these roads have sections where their drainage systems connect directly to stream channels.

Peak Flows and the Transient Snow Zone (TSZ)

No Action

Other influences within the watershed would continue.

Proposed Action

The analysis area is located in the Coastal Region of Western Oregon as delineated by the USGS (Harris *et al.* 1979). According to Greenberg and Welch (1998), rain-on-snow events are rare (50 – 100 year events) but have happened in the Coastal Region. However, the authors also state that snowmelt has had little or no effect on the maximum peak flow for these extreme events because snowmelt occurs early in the storm during the rising limb of the hydrograph.

A change in peak flows due to thinning in the TSZ is not likely. Research suggests that forest thinning treatments maintain patterns of snow accumulation that are similar to mature forests and have little effect on snowmelt rates during rain-on-snow events (Poggi *et al.* 2004). In addition, most rain-on-snow studies have found the greatest effects are from clear-cut areas that create large openings in the forest canopy (Berris and Harr 1987, Harr 1986, Harr and Coffin 1992, Satterlund and Adams 1992).

No measurable effect to stream flow is expected as a result of commercial thinning and density management because the project involves only partial removal of vegetation in five percent or less of each affected sub-watershed/drainage. In an overview of several studies, Satterlund and Adams (1992) found that “Lesser or nonsignificant responses occur [to water yield]... where partial cutting systems remove only a small portion of the cover at any one time.” Where individual trees or small groups of trees are harvested, the remaining trees will generally use any increased soil moisture that becomes available following timber harvest. Therefore, effects to stream flow from proposed harvest activities is not likely.

Peak Flows and Roads

No Action

It is likely that more roads would be constructed within the watershed by private entities to access their lands. It is unknown whether there would be enough road construction to exceed the Governors Watershed Enhancement Board (GWEB) threshold described below to cause impacts to flow regimes. However, new road design and construction practices required by the Oregon Department of Forestry (2007) have been greatly improved since the legacy roads were constructed in the 1960s and 1970s.

Proposed Action

The analysis area has a low risk of hydrologic impacts due to roads. This determination was made using a method for assessing the potential risk of the road network to cause an impact on stream flows, which was developed for the GWEB. The assessment assigns a “threshold of concern” for hydrologic impacts based on the percentage of area covered by roads. The threshold levels are 0-4 % low risk, 4-8 % moderate risk, and >8 % high risk (WPN 1999).

Based on GIS data, there are about 495 miles of road in the analysis area. Using an average road width of 30 feet (0.0057 miles), there are approximately 2.8 sq. miles covered by roads (0.0057 miles width x 495 miles length). This equates to about 3.1 % of the total area covered by roads (2.8 sq. miles road area / 89.8 sq. miles total area). Therefore, according to the GWEB method, the analysis area currently has a low risk (< 4 % road area) of hydraulic impacts due to roads. However, as stated by the authors, the condition of roads and the design of drainage systems may be just as important in determining the impact of roads on stream flow. The drainage systems of many roads in the analysis area are directly connected to stream channels.

The proposed project would result in a net decrease of approximately 5.7 miles of the total road network in the analysis area. This mileage would be disconnected from the stream network. Additionally, by improving road drainage, some roads proposed for renovation and improvement would effectively be disconnected from the stream network.

3.2.3.2 Stream Temperatures

The Oregon Department of Environmental Quality (ODEQ) develops water quality standards that protect beneficial uses of rivers, streams, lakes, and estuaries. Water bodies that do not meet water quality standards are placed on the States’ 303(d) list as Water Quality Limited (ODEQ 2006). Some streams in the analysis area are currently listed for not meeting state

standards. The Middle Fork Coquille River, Rock Creek, Bingham Creek, and Twelvemile Creek are listed for exceeding temperature standards. Unit URC18 is the closest harvest unit to a 303(d) stream listed for temperature. This unit is approximately 150 feet from Upper Rock Creek on the other side of North Rock Creek Road (30-10-3, see Map 3(f)). Unit SC13 is approximately 600 feet from the Middle Fork Coquille River. Other units are greater than 1,000 feet away from any listed stream.

Elevated stream temperatures can be caused by a lack of stream shading. A reduction in shade increases the amount of solar radiation reaching the stream surface (Moore and Miner 1997). Small streams within or adjacent to the proposed treatment units are currently well shaded by dense stands of conifers and some hardwoods.

No Action

The unthinned stands would continue to have unfavorable height to diameter ratios that increases the risk of blow down (Smith 1962), and subsequent exposure of the stream to solar heating. In addition, the unthinned condition would delay establishment of understory trees and shrubs with their associated multi-canopy layers that could provide shade in the event that some or all of the overstory shade is lost due to a catastrophic event (Levno and Rothacher 1969; cited in Adams and Ringer 1994).

Proposed Action

There would be no effect to stream temperatures in intermittent streams from the proposed action. Most of the streams within or adjacent to the proposed units are intermittent in nature, and they provide little or no surface flow to perennial stream reaches during the summer when elevated stream temperatures can occur.

On perennial streams, the 50-foot no-harvest buffers would maintain existing canopy closure directly over stream channels. Additionally, thinned areas would maintain approximately 60% canopy closure, and would provide adequate shade until the canopy re-closes (est. 5-10 years). Even with ¼-acre gaps (0.1 ha) proposed for Riparian Reserve treatments outside the 50 foot no-harvest buffers, a resulting canopy closure of 75% is probable (Fahey 2006 cited in Wilson and Puettmann 2007). Therefore, density management near these small perennial streams would also have no effect on stream temperature.

3.2.3.3 Sedimentation

Sediment input to stream channels is a result of both natural and management related processes. Primary sediment sources include episodic landslides and debris flows usually associated with intense winter storms (Townsend *et al.* 1977), hillslope erosion, stream bank erosion, and roads. Management related increases in sedimentation are most often the result of poorly designed and/or poorly maintained forest roads. These roads can be a major contributor of fine sediment to streams (Reid and Dunne 1984).

Field examinations have determined that some roads show evidence of surface erosion, inadequate drainage, inadequate stream crossings, or unstable cut-banks and fill slopes. These roads may provide excess fine sediment to adjacent streams due to poor road design and maintenance, road washouts, and subsequent debris flows.

No Action

Background sedimentation levels within the watershed would remain constant. Existing roads identified as potentially adding sediment to streams would not be renovated or decommissioned at this time. Some roads proposed for renovation or decommissioning would continue to deliver fine sediment to stream channels.

Proposed Action

The effects of proposed road work and harvest activities are analyzed below by category.

Road Construction

New road construction would have no effect on sediment delivery to stream channels and would not affect water quality. The proposed new roads would be primarily located on or near ridge tops and would incorporate design features that include avoiding fragile or unstable areas, minimizing excavation and height of cuts, endhaul of waste material where appropriate and construction during the dry season (USDI 1995). Road drainage features would be designed so that any sediment-laden surface water would quickly infiltrate into forest soils. With the implementation of the road management Project Design Features, these roads are not expected to increase sediment delivery to stream channels due to their locations, intervening forest buffers, and distances to streams. Therefore, the roads and landings would not affect water quality.

Road Renovation/Improvement

Renovation or improvement would have no potential for short-term (1-2 year) increased sediment delivery to stream channels. This is due to requiring soil displacement activities to occur within the dry season. Renovations of approximately 7.7 miles of existing road to winter haul standards would divert road drainage away from stream channels and towards the forest floor where it could re-infiltrate.

In the long-term (many years), road renovation and improvement would provide benefits to flow routing and water quality in the affected areas.

Decommissioning

Approximately 3.2-4.6 miles of road would be decommissioned (depending on haul season). Decommissioning these roads would reduce their potential to deliver sediment to stream channels or alter flow routing in the affected sub-watersheds.

Approximately 6 – 7.5 miles of the total would be fully decommissioned, again depending on the final determination of haul season. Full decommissioning would be designed to restore “natural hydrologic flow” (USDI 2002) and may include but is not limited to subsoiling or tilling, removal of unstable fills, removal of ditch relief culverts, construction of water bars, eliminating diversion potential at stream crossings, and construction of a suitable barrier to block access.

Decommissioning would result in a net of 5.7 road miles being removed from the hydrologic network with the potential to deliver sediment.

Haul Activities and Road Maintenance

Approximately 16.8 miles of the proposed haul road is paved. Approximately 30.3 miles of gravel road would be used for all season haul. Hauling would be restricted where road surfaces have inadequate rock surface for wet season haul. Approximately 2.0 miles of rock surface and 9.4 miles of natural surface road would be used for dry season only haul.

The proposed haul route crosses several streams. During the dry season, since there is little or no flowing water on road surfaces, there would be a negligible change in sediment delivery to streams as a result of haul on the proposed main haul routes and spurs. During the winter wet season, there would be a negligible change in sediment delivery from the paved haul routes because paved roads are not likely to produce much sediment (Reid and Dunne 1984).

Several design features listed in Chapter 2 (Design Features for the Proposed Action) would minimize the potential for increased sediment delivery from haul activities and road maintenance. These design features would be in place before winter haul and may include but are not limited to applying an additional lift of rock to stream crossings if there is a potential for road sediment delivery to a stream; containing any offsite movement of sediment from the road or ditch flow near streams with a suitable sediment filter; monitoring road conditions during winter use to prevent rutting of the rock surface; and suspending haul during very wet conditions.

Road maintenance during the life of the project would minimize road drainage problems and reduce the possibility of road failures and increased sediment delivery to streams.

The amount of fine sediment introduced to streams during haul activities would be indiscernible beyond natural erosion processes occurring during winter rains and would have no impacts to downstream resources. The majority of gravel-surface haul routes in the analysis area is under private control and used extensively throughout the year by private timber companies. The winter use of roads for the proposed project would be minimal, a few trips per day. The use of these roads is expected to be short term and limited by weather conditions as specified in the site specific project design features. Though some minor sedimentation may result from the additional proposed haul activities, occurrence should only take place during prolonged rainfall events (until haul is suspended as noted above). Further, due to the steady level of private haul presently on these roads, additional amounts should be negligible and not outside levels that presently occur during such rainfall events.

Density Management in Riparian Reserves

The 50-foot no-harvest buffers are intended to function as stream protection buffers to maintain shade, protect bank stability, and prevent sediment delivery to streams from adjacent harvest operations.

These no-harvest areas would be sufficient to maintain bank stability. Research has shown that the contribution of root strength in maintaining stream bank integrity occurs within a distance of approximately one-half the crown diameter of existing vegetation (FEMAT 1993). The crown diameter of existing second growth trees ranges from about 15-30 feet.

Therefore, the minimum 50-foot no-harvest width captures root strength from the existing vegetation. The no-harvest areas would also provide an adequate filter strip because non-compacted forest soils in the Pacific Northwest have very high infiltration capacities and are not effective in transporting sediment by rain splash or sheet erosion (Dietrich 1982). In the long term, large wood contributed to the stream channel as a result of density management has the potential to create additional capacity for sediment storage.

Yarding Corridors

Yarding corridors would be placed to minimize disturbance of the stream channel and prevent sediment delivery. Design features include using natural openings to the extent possible, minimizing the width (est. < 12 feet) and number of corridors, crossing channels at as perpendicular an angle as possible, and requiring at least one-end suspension of logs. In addition, trees felled within the no-harvest area to provide yarding corridors would be felled toward the stream channel and left on site to provide bank armoring. Therefore, due to these design features and the small area disturbed, there should be no increase in sediment as a result of these yarding corridors.

3.2.4 Aquatic Habitat

Aquatic habitat has been influenced by human activities within the Middle Fork Coquille Watershed. Many stream channels in the lower valleys are down-cut and are not connected with their floodplains. The Middle Fork Coquille River and portions of many tributary streams are constrained and influenced by roads. Streams within the analysis area are generally lacking in-stream structure, namely large woody debris (LWD) and channel complexity (USDI 2007a).

For a detailed description of aquatic habitat in the analysis area refer to the Middle Fork Coquille Watershed Analysis Version 1.1, October 2007. The Roseburg District BLM completed a revised Upper Middle Fork Coquille Watershed Analysis on May 25, 1999. The 6th field watersheds within the analysis area which are covered in the Upper Middle Fork Coquille Watershed Analysis include Upper Rock Creek, Twelve Mile Creek, and the Headwaters Middle Fork Coquille River (USDI 1999). The preceding documents are hereby incorporated by reference.

Endangered Species Act

The following summarizes the Endangered Species Act (ESA) status of fish species found within the analysis area:

- In a Federal Register published February 11, 2008 the National Marine Fisheries service issued the listing determination for the Oregon Coast (OC) coho salmon Evolutionary Significant Unit (ESU) as threatened effective May 12, 2008 (73 FR 7816). Critical Habitat was also designated. Within the analysis area coho critical habitat is located in Middle Fork Coquille River, Slide Creek, Sandy Creek, Upper Rock Creek, Little Rock Creek, and Slater Creek (Streamnet GIS Data 2003, USDC 2008). Natural barriers such as waterfalls and increased gradient limit the distribution of coho and coho critical habitat. An impassable 40-50 foot waterfall over boulders is located on Upper Rock Creek in the NW1/4 of T29S R10W section 35.

- The analysis area is located within the OC steelhead ESU. On April 15, 2004, NMFS moved some species from the candidate status to a species of concern status. This new category was introduced to better reflect those species that listing “was ‘not warranted,’ but significant concerns or uncertainties remained regarding their extinction risk and/or threats” (64 CFR 19975). The OC steelhead trout ESU (*O. mykiss*) is currently listed as a Species of Concern. Species of Concern status does not carry any procedural or substantive protections under the ESA
- Pacific lamprey (*L. tridentata*) is located within the analysis area and is listed as Species of Concern by the United States Fish and Wildlife Service.

Magnuson-Stevens Act (Essential Fish Habitat)

Streams used by coho and chinook salmon within the analysis area are designated as Essential Fish Habitat (EFH) under the Magnuson-Stevens Fishery Conservation and Management Act. Streams within the analysis area with EFH include Middle Fork Coquille River, Slide Creek, Sandy Creek, Upper Rock Creek, Little Rock Creek, and Slater Creek (Streamnet GIS Data 2003).

Special Status Species

Aquatic SSS which occur in the analysis area include Oregon Coast coho (federal threatened), Oregon Coast steelhead (Sensitive), and foothill yellow-legged frog (Sensitive). The yellow-legged frog analysis is covered in the wildlife report. Streams containing Oregon Coast coho and Oregon Coast steelhead within the analysis area include: Sandy Creek and an unnamed tributary to Sandy Creek with the confluence in the northeast ¼ of T29S R10W section 15 (StreamNet, 2003). Steelhead are also found in the analysis area in two other unnamed tributaries to Sandy Creek: one stream with the confluence in the northwest ¼ of T29S R10W section 27 and the other stream with the confluence in the northeast ¼ of T29S R10W section 15 (StreamNet, 2003). Table 2 lists other aquatic Sensitive species on the Coos Bay District, but not within the analysis area.

Table III-11: Bureau Sensitive Species not present in the Analysis Area

Species Name	Species Range
Pacific Coast chum salmon	The Middle Fork Coquille Watershed Analysis stated that chum was suspected to occur within the watershed (USDI, 2007). However, the 2005 Oregon Native Fish Status Report found chum salmon in the Coquille watershed to be an extinct population (ODFW 2005). Therefore, chum is not considered to occur in the Middle Fork Coquille.
Rotund lanx (snail)	Found in large turbulent waters of larger rivers – Range: Mainstem Rogue/Umpqua. Habitat not present.
Robust walker (snail)	Perennial seeps, shallow mud banks and marsh seeps leading into shallow streams. Range: Chetco River drainage. Outside of known range.
Pacific walker (snail)	Wet leaf litter and vegetation near flowing or standing water in shaded areas, high humidity. Range: Lower Millicoma sub-basin. Outside of known range.
Caddisfly (<i>Rhyacophila chandleri</i>)	Freshwater habitats. Range: Douglas, Lane, Deschutes counties. Outside of known range.

Approximately 447 acres within Riparian Reserves are proposed for DMT. Of the 447 acres, only 5 acres within Riparian Reserves are adjacent to coho critical habitat, Special Status Species habitat, and EFH. These 5 acres are located within a portion of Unit URC18 which is adjacent to Upper Rock Creek. There is a road which separates the DMT in unit URC18

and Upper Rock Creek. The distance between the road and Upper Rock Creek varies from 80 to 140 feet and is not included for treatment.

Riparian Reserve Characteristics including Large Woody Debris (LWD)

No Action

The Riparian Reserves would most likely not achieve the desired vegetation characteristics described in the ACS in the Northwest Forest Plan and the Coos Bay District RMP. Leaving the Riparian Reserves in their presently overstocked condition would increase the time to attain sufficient large conifers to provide an adequate source of LWD for streams. LWD levels would remain low in most streams for a longer time, resulting in lower habitat complexity. Adjacent aquatic habitat conditions would remain simplified until trees in riparian stands grow to larger sizes and eventually fall into stream channels. The health and distribution of aquatic species populations within the analysis area would remain at their current levels if thinning would not occur in Riparian Reserves.

Proposed Action

The proposed treatments inside the Riparian Reserves would begin to restore historic landscape level vegetation patterns. Increasing stand and species diversity as well as placing the stands on a trajectory towards developing late successional characteristics would be attained through the DMT prescription, the creation of gaps and by leaving a 50-foot no-harvest buffer.

Current and future recruitment of LWD would not be adversely affected by the proposed DMT because of the number of leave trees and the 50-foot no-harvest buffers. The proposed yarding corridors, which would pass through Riparian Reserves and the 50-foot no-harvest buffers, would not cause a measurable reduction in current or future recruitment of LWD because the corridors would be limited to 12 feet in width and the trees felled in the 50-foot no-harvest buffer would be left on site.

Gaps would be created within Riparian Reserves, but outside of the 50-foot no-harvest buffers. The proposed gap sizes are based on the crown widths of old-growth trees and the minimum size of gaps needed to establish Douglas-fir trees (Franklin 1977). Creating gaps within Riparian Reserves would increase structural and species diversity. The 50-foot no-harvest buffers would maintain a LWD recruitment source in areas where gaps would be created.

Creating snags in Riparian Reserves would improve the structural diversity in the short and long terms and increase the late-successional characteristics in the Riparian Reserve. The snags would be created outside of the 50-foot no-harvest buffer. Depending on the height of the snags when they eventually fall, they may or may not reach a stream channel. If any portion of a snag were to reach a stream channel it would function as LWD and improve in-stream conditions at that particular site. If snags fall and do not reach a stream channel they would function as coarse woody debris on upland sites.

Sediment

No Action

The levels of sediment currently in stream channels within the analysis area could increase in the short and long term. Roads contributing sediment to streams would have short and long term negative effects to coho critical habitat, special status species habitat, and essential fish habitat. Sediment entering streams could result in a reduction of spawning production, juvenile rearing survival, and insect production (Everest *et al.* 1987, Meehan 1991, Meyer *et al.* 2005, Waters 1995).

Proposed Action

The proposed thinning treatments are not expected to result in sediment reaching coho critical habitat, Special Status Species habitat, or Essential Fish Habitat (EFH). On all fish-bearing, perennial, and intermittent stream channels a 50-foot no-harvest buffer would be retained. The 50-foot no-harvest buffer would function to filter sediment resulting from harvest activities from reaching stream channels and therefore fish habitat.

The proposed yarding corridors would be constructed through Riparian Reserves including the 50-foot no-harvest buffer. A direct route for sediment to enter the channel would not be created because full suspension over the stream channel and banks would be required.

Best Management Practices (BMPs) and Project Design Features (PDFs) are expected to reduce and in some cases eliminate sediment entering stream channels from Road renovation, improvement, maintenance, and decommissioning. Following the first winter after road activities, sediment entering streams would become negligible.

The sediment entering stream channels would not cause changes in coho critical habitat, Special Status Species habitat, or EFH. Coho and Special Status Species survival and production would be maintained. The amount of sediment reaching headwater channels would not cause a reduction in macroinvertebrates, which are a food source for fish. Changes in embeddedness, interstitial spaces, and pool depth would not occur. An overall reduction in sediment entering streams is expected following road renovation, improvement, maintenance, and decommissioning because these road activities would generally reduce erosion and drainage problems.

Winter haul would not result in sediment affecting coho critical habitat, Special Status Species habitat, or EFH. Design Features and BMPs were specifically designed to eliminate sediment transport mechanisms to stream channels. Sediment derived from winter hauling would be primarily directed to ditch lines and then out of the ditchlines via ditch relief culverts. On gravel surface roads which could have winter haul ditch relief culverts would divert water out of the ditches before it would reach stream channels. Sediment directed to hillsides by ditch-relief culverts would filter into the soil prior to the sediment reaching stream channels. Brake *et al.* (1997) found that on established logging roads within the Oregon Coast Range, the maximum observed distance sediment traveled below a ditch relief culvert with vegetation filtering or a stream crossing culvert with stream material present (LWD, boulders, debris, etc) was typically not more than 6.21 meters.

There are two levels for winter/summer activities. Ten of the roads proposed for new construction and four existing roads would have a summer haul option and a winter haul option. These roads are not hydrologically connected to stream channels, coho critical habitat, Special Status Species habitat, or EFH because 1) the roads would be located on or near ridges, 2) would have no stream crossings, and 3) are located outside of Riparian Reserves. Because these roads are not hydrologically connected to stream channels selecting these roads for all season haul would not result in additional sediment entering coho critical habitat, special status species habitat, or EFH. The PDFs developed for winter haul would further reduce the potential for sediment to travel off the road prisms during winter haul.

The proposed road decommissioning activities would not result in sediment entering coho critical habitat, Special Status Species habitat or EFH because these roads are not located in close proximity to fish bearing streams. However, there would be an expected long term reduction of sediment. Removing the stream and ditch-relief culverts and stabilizing the drainage on roads would reduce the potential of the roads failing and sediment entering stream channels, coho critical habitat, Special Status Species habitat, and EFH.

The proposed new road construction would not deliver sediment to coho critical habitat, Special Status Species habitat, and EFH. The proposed new roads would be located either on ridges or other stable locations with no mechanisms for sediment to be transported to stream channels and coho critical habitat, Special Status Species habitat, and EFH. None of the proposed new roads are located within Riparian Reserves or have stream crossings. The closest proposed new road to fish habitat is road SC09-1, which is approximately 0.4 miles from fish in Little Rock Creek. The proposed road construction would not contribute sediment to streams or coho critical habitat, Special Status Species habitat, and EFH because of the location of the roads, the proximity of these habitats to the proposed roads, the lack of new construction within Riparian Reserves and stream crossings, and the PDFs which guide the construction and decommissioning of new roads.

The minimal amount of sediment generated from the above mentioned road activities would not adversely affect the federally proposed coho or proposed critical habitat, Special Status Species habitat, or EFH. Design Features, BMPs, and the proximity of coho, coho critical habitat, special status species habitat, and EFH in relation to road activities would prevent sediment from affecting these habitats.

Cumulative effects of past land management practices on private and BLM lands have contributed to degraded coho critical habitat, special status species habitat, and essential fish habitat conditions within the Middle Fork Coquille River Watershed. On BLM lands the Proposed Actions are expected to have beneficial effects on streams because of improvements in riparian conditions and reductions in road related sediment over the long term. This is expected to contribute to improved localized stream channel conditions and benefit coho critical habitat, Special Status Species habitat, and essential fish habitat within the Middle Fork Coquille River Watershed, although at a limited scale. Areas of localized sediment input would occur as a result of the proposed timber harvest activities and road related activities. There would be no cumulative effects to coho critical habitat, special status

species habitat, and essential fish habitat from timber harvest and road related activities at the 6th or 5th field watersheds. The potential increase of sediment from the proposed timber harvest activities and road related activities, when added to non-federal actions, would not affect coho critical habitat, Special Status Species habitat, and essential fish habitat at the 6th or 5th field watersheds scale. The cumulative effects are within the scope of anticipated effects to aquatic resources including fisheries analyzed in the Coos Bay District RMP EIS.

Essential Fish Habitat Assessment

The Proposed Alternative would not adversely affect EFH. This assessment fulfills the consultation requirements as described in the Magnuson-Stevens Fishery Conservation Management Act (16 U.S.C 1855(b)). Consultation with NMFS for EFH is not needed because there would be no adverse effects to EFH.

The BLM may incorporate an EFH assessment into NEPA documents and public notices pursuant to 40 CFR section 1500. EFH assessments contain sufficient information to satisfy the requirements in 50 CFR 600.920(g) for EFH assessments and must clearly be identified as an EFH assessment. Mandatory contents of an EFH assessment are: 1) a description of the Proposed Actions, 2) an analysis of individual and cumulative adverse effects of the action on EFH, the managed species, including affected life history states, and associated species such as major prey species, 3) a determination of effects on EFH, and 4) a discussion of proposed mitigation, if applicable.

Mandatory contents of EFH Assessment:

- 1) Description of the Proposed Actions: A description of the Proposed Actions can be found within Chapters 1 and 2 of the Slater Rocks EA.
- 2) Analysis of individual and cumulative adverse effects on EFH: The Design Features would eliminate sediment input to EFH. The proposed DMT within the Riparian Reserves (including the no harvest buffers) would maintain current LWD recruitment and enhance future LWD. Because of the Riparian Reserve no harvest buffers, there would not be an increase in stream temperatures. Riparian Reserve no harvest buffers would protect stream bank stability and filter sediment derived from harvest activities. Vegetation thinning within Riparian Reserves would accelerate the growth rate of trees which would increase the potential recruitment of LWD in the long term and increase the quality and quantity of pools. Road maintenance would reduce some of the chronic sediment input to stream channels.
- 3) Determination of effects on EFH: The Proposed Actions in Alternative 2 Would Not Adversely Affect EFH. The current quantity and quality of EFH within the analysis area would remain.
- 4) Proposed mitigation: Best management practices found within the Coos Bay District RMP and Design Features located in Chapter 2 of the Slater Rocks EA would mitigate adverse impacts to EFH.

The full analysis on specific actions including commercial thinning, density management thinning, road work, and hauling resulting in the no adverse effects findings for EFH is located in the analysis files.

Endangered Species Act

The Proposed Actions have been determined to have “*no effect*” on OC coho and critical habitat. Because of the “*no effect*” determination consultation with NMFS is not needed. The complete analysis on specific actions including commercial thinning, density management thinning, and road work and hauling resulting in the “*no effect*” determination for OC coho and coho critical habitat is located within the analysis files and hereby incorporated by reference.

The incorporation of Design Features and distant proximity to coho and coho critical habitat would eliminate adverse effects from sediment derived from road related activities. The proposed DMT within the Riparian Reserves (including the no-harvest buffers) would maintain current LWD recruitment, enhance future LWD in stream channels, and have no effect on water quality.

Special Status Species

The Proposed Actions would not contribute to the need to list the species with Sensitive status under the Endangered Species Act. The habitat for Special Status Species would be maintained. There would be no expected increase in stream temperatures. The BMPs and the Design Features would eliminate the transport mechanism of sediment entering Special Status Species habitat.

3.2.5 Botanicals

Special Status Species

There are no known or suspected T & E vascular, nonvascular, or fungal plant species in the project area.

Of the 101 known or suspected special status plant species on the Coos Bay District, there are 38 Bureau Sensitive species suspected of occurring in the Slater Rocks project area (Appendix A). This determination is based on the proposed project overlapping the known or suspected range of a species and the likelihood that potential habitat is present. Potential habitat is determined by aerial photographic interpretation, review of information on each species habitat requirements, and proximity of known site locations.

There are 24 special status species for which surveys are recommended. Vascular plants, lichen and bryophyte surveys are ongoing and are anticipated to be completed by the end of September, 2008. As of 12 February 2008, the following special status species have been located during pre-disturbance surveys: one Bureau Sensitive lichen species- *Bryoria subcana* and five Bureau Sensitive fungal sites- *Phaeocollybia spadicea* (3 sites), *Phaeocollybia olivacea* (one site), and *Phaeocollybia sipei* (one site). The five fungal were located incidentally during fall lichen and bryophyte surveys.

Other Plants

The overall bryophyte and lichen diversity is low in these densely stocked, conifer-dominated units. Uncharred decay class 3, 4, and 5 down wood, rocky outcrops, riparian areas, and hardwood patches harbor the majority of the bryophyte diversity. Lichens are typically more abundant on the edges of proposed units, in areas where there is a hardwood component, in units with remnant trees (which varies from none in most units to scattered in a few units), along ridgelines, and where there are canopy gaps that allow sunlight to penetrate into the lower canopy and onto the forest floor. Early seral green-algal lichens dominate the lichen community in all of these plantations with alectorioid lichens being uncommon and cyanolichens almost absent except in units adjacent to older stands where the older trees have been able to seed the adjacent young plantation.

No Action

Young 30 to 70 year old plantations in the stem-exclusion stage (Oliver 1981) would remain densely stocked with very little light reaching the forest floor. As a result, there would be less shrub cover in the understory than if the stands were thinned (Bailey and Tappeiner 1998, Bailey and Tappeiner 2002).

Overall macrolichen diversity would remain low under dense canopies with the greatest diversity occurring in areas with hotspot characteristics.

In the Coast Range of Oregon, there is no apparent difference in bryophyte species richness between unthinned and thinned stands less than 50 to 80 years old. However, bryophyte abundance on older shrubs may actually be greater in unthinned stands because they would not be adversely affected by damage due to logging (Rosso 2002). Thus, bryophyte diversity would likely remain unchanged.

The present fungal community and the current species association would remain unchanged.

The stem-exclusion stage condition of the proposed stands is not favorable for light-loving vascular or non-vascular plant species and the general sparse nature of understory vegetation would continue along the current trajectory of stand development.

Proposed Action

Thinning these units would initially open up the canopy allowing sunlight to reach the forest floor. This would benefit light-loving vascular and non-vascular species. The open nature of the canopy would last several years, but they would eventually close again restricting the amount of light reaching the forest floor. This would make conditions less desirable for light-loving species but possibly benefit some fungal species.

Special Status Species

Lichen, bryophyte and vascular plant species surveys are on-going and will be completed by September, 2008. Any Special Status plant species found would be buffered (Brian *et al.* 2002) in order to protect the microsite and ensure that the proposed action would not contribute to the need to list the species. Since it is not considered practical to survey for

fungi (Cushman and Huff 2007) no surveys would be conducted for any Special Status fungal species. There are 14 species suspected of occurring in the project area (Appendix B).

To comply with Bureau policy to assess the effects of a proposed action on Special Status Species, the “Conservation Assessment for Fungi Included in Forest Service Regions 5 and 6 Sensitive and BLM California, Oregon and Washington Special Status Species Programs” was consulted. This conservation assessment lists general characteristics of some specific federal management actions that serve as examples of actions that may potentially threaten known fungal sites (Cushman and Huff 2007). These characteristics include:

1. Actions that intensively or extensively remove or consume the woody substrate, forest floor litter, or shrub hosts with which the species is associated. These include high intensity fire/burning, densely spaced pile burning, and mastication or chipping to reduce the fuel bed.
2. Actions that remove or destroy the fungal organism, such as extensive applications of long-term fire retardant/foam and intensive mushroom harvesting and raking.
3. Actions that remove host tree species or significantly modify the microclimate at the species’ site. These include thinning, regeneration, shelterwood and green tree retention prescriptions where host trees are removed and canopy cover (which aids in the retention of forest floor moisture) is reduced to around 40% or less.

As outlined by this conservation assessment, thinning these proposed units would not cause actions that intensively or extensively remove or consume the woody substrate, forest floor litter, or shrub hosts with which the individual species are associated nor would thinning cause actions that would remove or destroy the fungal organism. In addition, thinning prescriptions for the proposed units would not result in forest canopy covers less than 40%. Identified Special Status fungal sites would be protected using known site management recommendations developed by the Coos Bay District (Brian *et al.* 2002). Thus, thinning the proposed project area would not result in specific federal management actions that may potentially threaten known Special Status fungal sites (Cushman and Huff 2007).

Vascular Plants

Thinning these young Douglas-fir stands would hasten the development of multistory stands by recruitment of conifer regeneration in the understory as well as by enabling the survival of small overstory trees and growth of advanced understory regeneration (Bailey and Tappeiner 1998). Richness, frequency, and cover of some herbaceous species and most species groups, including exotics, are also greater in thinned stands than in unthinned stands (Bailey *et al.* 1998). Although thinned stands have a greater number of exotic plants than do unthinned or old-growth stands, exotic plant cover is normally low (Bailey and Tappeiner 2002).

Non-vascular Plants

Thinned stands support a slightly higher abundance of forage lichens than do unthinned stands less than 50 to 80 years old (Peterson 2002). However, traditional commercial thinning appears to have little effect on the overall epiphytic macrolichen communities in young stands (Peterson and McCune 2001). This is because traditional commercial thinning often reduces the number of tree species present in a stand, removes remnant older trees or small diameter trees, and evens spacing between trees (Peterson and McCune 2001).

Leaving with-in stand hotspots such as remnant trees, large wolf trees, old shrubs, and hardwood trees helps to maintain or increase lichen diversity in thinned stands (Peterson 2002).

Within Riparian Reserves, lichen diversity would be expected to increase with the inclusion of stand treatments such as gap creation, hardwood retention, no-harvest buffers which include wolf trees, and reservation of remnant trees.

As stated earlier, there is no apparent difference in bryophyte species richness between unthinned and thinned stands in the Oregon Coast Range (Rosso 2002). Retention of hardwoods species during thinning would contribute to more diverse bryophyte community abundance. In addition, retention and creation of coarse woody debris in managed stands provides a variety of decay classes for some bryophyte species, and the retention of remnant mature overstory conifers would ensure a continuing supply of coarse woody debris to the forest floor (Rambo and Muir 1998).

There are limited data available on the effects of forest management as related to fungi richness and abundance. One common species of ectomycorrhizal fungi, chanterelle (*Cantharellus formosus*), was found to fruit in significantly lower numbers following thinning. The declines were greatest in the most heavily thinned stands. As the stands in the proposed action would result with a variable density after treatment, there would be areas with little disturbance and areas with heavier thinning. It is possible that as the trees resume vigorous growth and the forest canopy closes, this species would begin to fruit at the same levels it did prior to the thinning; however, further studies are required to verify this (Pilz *et al.* 2002).

3.2.6 Forest Fuels and Fire

Much of the project area lies within an area of intensive use by the public for recreational and work related activities which can occur during periods of high fire danger. There are no acres designated as Wildland Urban Interface (WUI). WUI is identified in the Southwest Oregon Fire Management Plan (USDA *et al.* 2004).

No Action

No direct short-term impacts to the fuels and fuel loadings of the proposed project area would occur.

Long-term build up and accumulation of dead or dying fuels (both ground and aerial) would be an indirect consequence of the stagnant stand conditions. This condition could make the stands more susceptible to a damaging stand replacement fire causing a high contribution of particulate emissions into the air shed and may hamper fire control efforts during a wildfire event.

Proposed Action

Reducing the tree density would improve stand vigor, remove portions of the ladder fuels, and greatly decrease the primary source for future ground fuels. Thinning stands would lessen the inherent risk of a stand replacement fire by removing spatial live fuel structure and/or modifying horizontal and vertical arrangements of fuel loadings. This modification

occurs during the use of machinery or when using yarding corridors during a cable logging activity. Though thinning would create a short term increase in fine fuels, the removal of trees would expose the ground to sunlight that would stimulate brush species to grow at more rapid rate and occupy a larger percentage of the site. As the live fuel component builds within the fuel base, the resulting shade reduces surfaces temperatures and increases fuel moistures, therefore promoting decomposition of hazardous fuels. In this condition of decomposition the fuels retain water longer which would strengthen the resistance to fire starts in early to mid-summer. Also, the proposed treatments could facilitate fire suppression activities by providing safe ingress and egress for wildfire suppression resources and for counter fire suppression strategies if an extreme fire occurs (Martinson and Omi 2002). Logging contractors associated with the increased activity would operate under approved fire prevention plans and operations fires are relatively rare in the region.

In preparation for an unlikely occurrence of a wildfire within a commercial thinned area, fuel reduction zones could be established to ensure quick access to and suppression of any unplanned fire activity. These areas would be strategically located along ridge lines and/or adjacent to heavy use road systems. Treatments would mostly occur in the logging activity fuels, but in some instances could occur in heavy accumulations of natural fuels. All fuel reduction treatments would be on the surface only and would not be a soil disturbing activity. Treatments could include: hand piling, covering and burning, fuels pullback or lop and scatter.

Waterholes existing within the project area could receive improvements to include tree and brush removal and road access renovation (surface rock).

3.2.7 Consistency with the Aquatic Conservation Strategy

Components of the Aquatic Conservation Strategy

There are four main components to the Aquatic Conservation Strategy (ACS): Riparian Reserves, Key Watersheds, Watershed Analysis, and Watershed Restoration. A “fifth” component is a subset of these four, and is the standards and guidelines for management activities. These standards and guidelines were incorporated into the Draft Coos Bay District Management Plan preferred alternative which was under development (p. A-2). With the signing of the Record of Decision for the Resource Management Plan in May of 1995, these standards and guidelines were superseded by the RMP management actions/direction.

1) Riparian Reserves:

The Riparian Reserve widths within the analysis area are two site potential tree heights (400 feet) for fish bearing streams and one site potential tree height (200 feet) for perennial and intermittent streams. Density management treatments would occur within Riparian Reserves and are designed to:

- promote development of large conifers
- recruit large woody debris (LWD)
- improve diversity of species composition and stand density
- promote forest health.

Stands within Riparian Reserves in the proposed units are in an over-stocked condition primarily as a result from previous harvest. If left untreated, the Riparian Reserves would not achieve the desired vegetation characteristics described in the ACS in the Record of Decision for the Northwest Forest Plan (USDA and USDI 1994b) and the Coos Bay District Resource Management Plan (USDI 1995). Controlling the stocking in the Riparian Reserves through density management treatments is necessary to meet desired future conditions. The proposed treatments inside the Riparian Reserves would begin to restore historic landscape level vegetation patterns.

2) Key Watersheds:

The Slater Rocks project area is not located within a Key Watershed. The Middle Fork Coquille River 5th field watershed is not designated as a Key Watershed in the Coos Bay District RMP.

3) Watershed Analysis:

The Middle Fork Coquille Watershed Analysis version 1.1 was completed in October 2007. The proposed activities in the Action Alternative are consistent with the Middle Fork Coquille Watershed Analysis.

The proposed activities in the Slater Rocks EA are consistent with the recommendations listed below from the Middle Fork Coquille Watershed Analysis because it would follow the management directions in the Northwest Forest Plan and the RMP including the ACS, BMPs, and Riparian Reserve management.

The following is a summary of the issues and recommendations which are pertinent to the Slater Rocks EA:

- Ample opportunity exists in the analysis area for silvicultural manipulation of riparian areas on public land, to accelerate progression toward desired conditions. (p.21)
- Planned riparian enhancement and road-related projects should have positive long-term affects on water quality. (p.28)
- The desired future condition for road management in the Middle Fork Coquille is to reduce the risk potential of existing roads, and design new roads to minimize future risks that affect water quality. Future management decisions of these roads within the watershed will use an interdisciplinary resource approach to evaluate risks, control and prevent road related runoff and sediment production, identify new road locations as well as those existing roads to be closed, and identify culverts blocking fish passage. (p.29)

Project-level planning/restoration opportunities:

- Closing and stabilizing, or obliterating and stabilizing roads based on the transportation management objectives (TMOs).
- Reconstructing roads and associated drainage features that pose a substantial risk.
- Upgrading road surfacing.
- Produce future down woody material and snags within young aged stands through the use of pre-commercial and commercial thinning of trees.

- Produce snags in stands presently devoid of snags for use as older decay classes in the future.

4) Watershed Restoration:

As stated in the Coos Bay RMP, “Th[is] program’s most important components are control and prevention of road-related run-off and sediment production, restoration of the condition of riparian vegetation, and restoration of instream habitat complexity” (p.8) Specific management actions/directions applicable to the Slater Rocks EA for watershed restoration include:

- Focus watershed restoration on removing some roads and, where needed, upgrading those that remain in the system.
- Apply silvicultural treatments to restore large conifers in Riparian Reserves.
- Restore stream channel complexity. Instream structures will only be used in the short term and not as mitigation measure (RMP pg. 8).

Proposed activities which would accomplish management actions/directions for watershed restoration include density management thinning in riparian reserves, road renovation, road improvement, and road decommissioning.

Management Actions/Direction:

The following is a list of management actions/directions for timber and road management within Riparian Reserves applicable to the proposed activities. A complete list can be found in the Coos Bay RMP pages 13-14.

Roads Management:

- Minimizing road and landing locations in Riparian Reserves.
- Preparing road design criteria, elements, and standards that govern construction and reconstruction.
- Preparing operation and maintenance criteria that govern construction and reconstruction.
- Minimizing disruption of natural hydrologic flow paths, including diversion of streamflow and interception of surface and subsurface flow.
- Restricting sidecasting as necessary to prevent the introduction of sediment to streams.
- Reconstructing roads and associated drainage features that pose a substantial risk.
- Closing and stabilizing roads based on ongoing potential effects to the ACS objectives and considering short-term and long-term transportation needs.

Timber Management:

- Apply silvicultural practices for Riparian Reserves to control stocking, re-establish and manage stands, and acquire desired vegetation characteristics needed to maintain ACS objectives.

The Coos Bay District RMP’s BMPs and the Northwest Forest Plan S&Gs are also incorporated into the Proposed Action. These measures were designed to maintain water quality and soil productivity. S&Gs are “. . . the rules and limits governing actions, and the

principles specifying the environmental conditions or levels to be achieved and maintained" (USDA and USDI 1994).

Design Features were developed in addition to the Management Actions/Directions, BMPs, and S&Gs to avoid, minimize or rectify impacts on resources and are included as part of the action alternative (see Chapter 2). Design Features incorporated Management Actions/Directions when designing this project in order to attain or meet the Objectives of the Aquatic Conservation Strategy. Design Features are site specific measures, restrictions, requirements or physical structures included in the design of a project in order to reduce adverse environmental impacts.

Existing Watershed Condition

The existing conditions of the Middle Fork Coquille River 5th field watershed are:

- The BLM administers 63,065 out of 197,607 acres within this watershed or 32% of the land within the 5th field watershed.
 - Approximately 27,373 acres or 43.4% of BLM land are in the interim Riparian Reserves.
 - 36% of the trees within Riparian Reserves are 0-40 years old.
 - The BLM controls approximately 385 miles of road or 31% of all road miles within the watershed.
 - There are 278 miles of fish bearing streams within the watershed. Several long standing barriers limit anadromous salmonids to 79.7 miles of this total or 27% of available fish bearing stream miles.
-

Aquatic Conservation Strategy Objectives

1. Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.

The landscape-scale features necessary to ensure the protection of the aquatic systems applicable to the Slater Rocks EA include the riparian area associated forest stands.

Riparian area associated forest stands provide many functions which include “the maintenance of surface and ground water quality in aquatic systems; ... maintenance of streambank and streambed stability; maintenance and protection of habitat structure for fish, wildlife, and vegetation; and maintenance of favorable microclimates for riparian-dependant species” (Everest and Reeves 2006).

Riparian area functions that will be analyzed include microclimate, water quality, streambank stability, sediment regimes, and habitat provided for riparian associated species. Microclimate will be addressed under ACS Objective 1. Water quality issues are in

Objectives 3 and 5; streambank stability and sediment regimes are in Objectives 4, 6, and 7; and providing habitat for riparian associated species is found in Objectives 2, 8, and 9.

Microclimate

Site Scale Analysis

Short Term/Long Term

Microclimates found in riparian areas are important components of watershed and landscape-scale features needed to ensure the protection of the aquatic systems. The 50-foot no-harvest buffers would include the slope break and the retention of riparian vegetation. Anderson et al. (2007) found that microclimate gradients in headwater riparian zones were strongest within 10 meters of the stream center, “a distinct area of stream influence within broader riparian areas.” Because of the 50-foot no-harvest buffers on all streams, changes to microclimates within the project area would remain unchanged or unrecognizable from the natural range of variability at the site scale in the short and long terms. Buffer widths, determined by either the change in riparian to upland vegetation or by the topographic slope breaks, were found to be sufficient in maintaining microclimate post upslope harvest (Anderson et al. 2007). Chan et al. found the greatest change in microclimate occurs between stream center and 15 meters regardless of buffer size or upland treatment (2004).

The proposed yarding corridors would not measurably alter the microclimate at the site scale in the short or long terms because of the minimal width (12 feet), the locations would be spread out across the landscape, they would be discontinuous, and the majority of corridors would be located across intermittent streams.

5th Field Analysis

Short Term/Long Term

Because of the small amount of BLM land at the 5th field scale, the overall condition of the watershed and landscape-scale features would remain unchanged at the 5th field scale in the short and long terms.

2. Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependant species.

Site Scale Analysis

Short Term/Long Term

Maintaining the Riparian Reserve network would ensure the effectiveness of the spatial and temporal connectivity within and between watersheds at the site scale in the short and long terms.

The DMT prescription designed for Riparian Reserves along with the 50-foot no-harvest buffers would retain floodplains, wetlands, upslope areas, headwater tributaries, and intact

refugia needed by aquatic and riparian-dependant species for fulfilling life history requirements.

The proposed DMT within Riparian Reserves but outside of the no harvest buffers would not inhibit spatial or temporal connectivity within and between watersheds. The proposed DMT would ensure the long-term health and function of the Riparian Reserves by advancing the stands toward late successional characteristics.

No new physical obstructions would be created in streams because no new roads would be constructed across stream channels. Water quality would be maintained so migration routes would not be chemically obstructed.

5th Field Analysis

Short/Long Term

The spatial and temporal connectivity within and between watersheds at the 5th field scale in the short and long terms would remain unchanged as a result of the Proposed Actions. The small amount of BLM land at the 5th field scale, the relatively small amount treatment area, and the lack of culvert replacements which pose as barriers would prevent measurable improvements in connectivity.

3. Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.

Site Scale Analysis

Short Term

The physical integrity of the aquatic system including shorelines, banks, and bottom configurations would be maintained at the site scale in the short term. The Proposed Action would not adversely modify any stream channels or aquatic habitat, nor remove any wood from any channel. The proposed new road construction is located on ridgetops. New construction would not take place within any Riparian Reserves. None of the proposed new road construction would have stream crossings or are located in valley bottoms. Riparian Reserve buffers would assist in maintaining bank stability, shorelines and bottom configurations. Seasonal restrictions and no harvest buffers would further ensure stream bank stability.

The 50-foot no-harvest buffers would be sufficient to maintain bank stability. Research has shown that the contribution of root strength in maintaining stream bank integrity occurs within a distance of approximately one-half the crown diameter of existing vegetation (FEMAT 1993). The crown diameter of existing second growth trees ranges from about 15-30 feet. The minimum 50-foot no-harvest buffers would maintain root strength from the existing vegetation along the stream bank.

The proposed yarding corridors through the Riparian Reserves and the 50-foot no-harvest buffers would not cause changes in shorelines, banks or bottom configurations because full suspension would be required when yarding over stream channels and stream banks. Stream

bank stability would not be reduced as a result of cutting trees within this buffer because the corridors would be limited to 12 feet in width and the felled trees would be left on site.

Long Term

Development of late successional characteristics in Riparian Reserves would increase the potential for LWD to deliver to stream channels at the site scale in the long term. LWD in stream channels provides channel structure and complexity which improves bank stability.

5th Field Analysis

Short Term/Long Term

As there would be no noticeable impact to the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations at the site scale, there would be no change at the 5th field watershed scale in the short or long terms.

4. Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.

Site Scale Analysis

Short Term/Long Term

Water quality necessary to support healthy riparian, aquatic and wetland ecosystems would be maintained at the site scale in the short and long terms. Water quality would remain within the range that maintains the biological, physical, and chemical integrity of streams.

The Proposed Action is not expected to result in an increase in stream temperatures at the site scale in the short or long terms. The 50-foot no-harvest buffers along streams would maintain existing canopy closure directly over stream channels and, along with maintaining approximately 60% canopy closure outside of these areas, would provide adequate shade until the canopy re-closes (est. 5-10 years). The proposed DMT treatments would have a negligible effect on stream temperature. Thinning stands near streams would result in favorable height to diameter ratios of the remaining trees, which decreases the risk of blow down (Smith 1962) and subsequent exposure of the stream to solar heating. Thinning would encourage establishment of understory trees and shrubs with their associated multi-canopy layers that could provide shade in the event that some or all of the overstory shade is lost due to a catastrophic event (Levno and Rothacher 1969; cited in Adams and Ringer 1994).

Stream temperatures would not be affected as a result of the yarding corridors at the site scale in the short or long term because of the minimal width (12 feet), the locations would be spread out across the landscape, they would be discontinuous, and the majority of corridors would be located across intermittent streams.

Slight increases in turbidity could occur in the short term in some localized areas as a result of road and harvest related activities, but would not measurably alter water quality. Design Features were designed to minimize the amount and duration of sediment entering stream channels. Such increases in turbidity would not measurably alter the biological, physical, or

chemical integrity of streams. Aquatic and riparian-dependent species' survival, growth, reproduction, and migration would be maintained. The proposed road renovation, improvement, maintenance and road closures would result in a net reduction in turbidity in stream channels in the long term.

The Proposed Action is not expected to result in any chemical inputs to stream channels. Herbicide use is not included as part of the project.

5th Field Analysis

Short Term/Long Term

As there would be no noticeable impact to water quality at the site scale, there would be no change in water quality at the 5th field watershed scale in the short or long terms as a result of the Proposed Action.

5. Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.

Site Scale Analysis

Short Term

The sediment regime under which aquatic ecosystems evolved would be maintained at the site scale in the short term. The timing, volume, rate, and character of sediment input, storage, and transport would be maintained and in some cases improved due to some of the proposed road related activities.

Short term sediment movement may occur as a result of the Proposed Actions; however Design Features and BMPs would minimize or eliminate the sediment input to stream channels. The amount of fine sediment introduced to streams during the proposed timber sale activities would be indiscernible beyond natural erosion processes expected to occur during winter rains. See Section 2.5.5.3 on sedimentation for a more detailed discussion of sediment.

Long Term

The proposed road renovation, improvement, maintenance and road decommissioning would result in a net reduction in sediment delivery to stream channels at the site scale in the long term. Some existing roads within the analysis area are currently contributing sediment to stream channels from surface erosion, inadequate drainage, inadequate stream crossings or unstable cutbanks and fill slopes. The Proposed Action would improve these roads by restoring adequate drainage and thus reducing sediment delivery to streams. The Proposed Action also includes decommissioning roads which would include properly routing water and installing water bars.

The proposed road decommissioning would result in a long term reduction of sediment entering streams at the site scale. Stabilizing the drainage on these roads would reduce the potential of the roads failing and sediment entering stream channels.

The proposed harvest would not result in additional sediment delivery to stream channels at the site scale in the long term. In the long term, large wood contributed to the stream channel as a result of density management has the potential to create additional capacity for sediment storage.

5th Field Analysis

Short Term/Long Term

As there would be no noticeable impact to the sediment regime at the site scale from harvest activities, there would be no change at the 5th field watershed scale in the short or long terms.

The expected sediment to be delivered at the site scale in the short term would not be measurable at the 5th field scale in the short or long terms. At this scale, taking into consideration the small amount of BLM land compared to privately owned lands and the relatively small size of the project, the Proposed Action would provide a negligible benefit of reduced sediment delivery to stream channels.

6. Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetlands habitats to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.

Site Scale Analysis

Short Term/Long Term

In-stream flow sufficient to create and sustain riparian, aquatic and wetland habitat would be maintained at the site scale in the short and long terms. Patterns of sediment, nutrient, and wood routing in addition to the timing, magnitude, duration, and spatial distribution of peak, high, and low flows would be maintained at the site scale in the short and long terms.

No measurable effect to stream flow is expected as a result of commercial thinning and DMT because the project involves only partial removal of vegetation in five percent or less of each affected sub-watershed/drainage. In an overview of several studies, Satterlund and Adams (1992, p. 253) found that “Lesser or nonsignificant responses occur [to water yield]... where partial cutting systems remove only a small portion of the cover at any one time.” Where individual trees or small groups of trees are harvested, the remaining trees would generally use any increased soil moisture that becomes available following timber harvest.

A method for assessing the potential risk of the road network to cause an impact on stream flow was developed for the Governors Watershed Enhancement Board (GWEB). The assessment assigns a “threshold of concern” for hydrologic impacts based on the percentage of area covered by roads. The threshold levels are 0-4 % low risk, 4-8 % moderate risk, and above 8 % high risk (WPN 1999 p IV-15). Based on GIS data, there are about 495 miles of road in the analysis area. Using an average road width of 30 feet (0.0057 miles), there are approximately 2.8 sq. miles covered by roads (0.0057 miles width x 495 miles length). This equates to about 3.1 % of the total area covered by roads (2.8 sq. miles road area / 89.8 sq. miles total area). Therefore, according to the GWEB method, the analysis area currently has a low risk (< 4 % road area) of hydraulic impacts due to roads. As stated by the authors, the condition of roads and the design of drainage systems may be just as important in

determining the impact of roads on stream flow. The proposed project would result in a net decrease of approximately 5.7 miles of the total road network in the analysis area. In addition, by improving road drainage, some roads proposed for renovation and improvement would effectively be disconnected from the stream network.

5th Field Analysis

Short Term/Long Term

As there would be no impacts to in-stream flows at the site scale, there would be no changes at the 5th field scale in the short or long terms.

7. Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.

Site Scale Analysis

Short Term/Long Term

The timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands would not be affected by the Proposed Action at the site scale in the short or long term. The interaction of water with wetlands and meadows would be unaffected at the site scale both in the short and long terms.

There are no known meadows within any proposed units. The only known wetland within a proposed unit is located in unit SC06. The wetland would have a Riparian Reserve boundary of 200 feet, a no-harvest buffer of 50 feet and ground-based equipment would not be permitted to travel through the wetland. If additional wetlands are discovered during unit layout they would be buffered accordingly. The project does not include water diversions or well drilling, which are activities usually associated with lowering water tables.

5th Field Analysis

Short Term/Long Term

As there would be no noticeable impact to the timing, variability, and duration of floodplain inundation and water table elevation in meadows or wetlands at the site scale there would be no change at the 5th field watershed scale in the short or long terms.

8. Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.

Site Scale Analysis

Short Term/Long Term

Species composition and structural diversity of plant communities in riparian areas and wetlands would be maintained at the site scale in the short and long terms.

Density management thinning and gap creation would occur within Riparian Reserves outside of 50 feet from the stream channel. Conifers would be thinned to promote forest

health, promote development of large conifers, enhance large woody debris development, and improve diversity of species composition and stand density. Chan et al. (2006) found cover was initially reduced in response to thinning, but had an overall positive effect to understory vegetation and diversity within sample sites in the Oregon Coast Range.

Creating snags in Riparian Reserves would improve the structural diversity in the short and long terms at the site scale and increase the late-successional characteristics in the Riparian Reserve. The snags would be created outside of the 50-foot no-harvest buffer.

Nutrient availability within Riparian Reserves would increase as a result of the proposed DMT and gaps. The proposed treatments would increase brush and deciduous tree growth which would increase nutrient availability in Riparian Reserves. Alders and other deciduous hardwoods would be retained in the Riparian Reserves, unless cut within yarding corridors.

5th Field Analysis

Short Term/Long Term

Because there would be no noticeable adverse impact to species composition and structural diversity of plant communities in riparian and wetland areas at the site scale there would be no change in at the 5th field watershed scale in the short or long term. Because of the relatively small size of the project benefits would not be measurable at the 5th field watershed scale.

9. Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.

Site Scale Analysis

Short Term/ Long Term

Habitat needed to support riparian-dependent species (including plants, invertebrates, and vertebrates) would be maintained at the site scale in the short and long term.

No-harvest buffers would provide areas of undisturbed litter layers, structures, vegetation, and protected microclimates that would provide refugia areas for riparian-dependant plants and animals. Microclimates were discussed under ACS Objective 1.

Following the proposed treatments in the Riparian Reserves, habitat would be maintained and would be expected to improve at the site scale in the short term and long term. The proposed DMT, the 50-foot no-harvest buffers, and the creation of gaps would increase structural and species diversity in Riparian Reserves. The no-harvest buffers would provide areas of undisturbed litter, structure, vegetation, and protected microclimates which would provide refugia areas for riparian-dependant plants and animals. Creating gaps would increase brush and deciduous tree growth which would increase plant, animal, and insect diversity and abundance. DMT treatments would provide conditions favorable for the development of diversified layers of herbs, shrubs, and pockets of shade tolerant trees.

Creating snags in Riparian Reserves would improve the structural diversity in the short and long terms at the site scale and increase the late successional characteristics in the Riparian

Reserve. The snags would be created outside of the 50-foot no-harvest buffer. Depending on the height of the snags when they eventually fall they may or may not reach a stream channel. If any portion of the snags were to reach a stream channel it would function as LWD and improve instream conditions at that particular site. If the snags fall and do not reach a stream channel they would function as coarse woody debris on upland sites.

The proposed DMT is expected to increase the stand complexity within Riparian Reserves. An increase in stand complexity should increase insect abundance and diversity at the site scale in the short and long terms.

Zobrist and Hinckley (2005) conducted a literature review of thinning and compiled the following discussion of the effects of thinning to understory plant species: “Thinning opens up the stand and allows light to reach the forest floor. This provides for better developed understories with greater richness, diversity, and cover (Bailey et al. 1998, Curtis et al. 1997, Thomas et al. 1999, Thysell and Carey 2000). Studies have found that thinned stands have greater herbaceous cover (Carey and Wilson 2001, Muir et al. 2002), greater understory trees and shrubs (Bailey and Tappeiner 1998, Muir et al. 2002, Tappeiner and Zasada 1993), and greater density, survival, and growth of conifer seedlings (Bailey and Tappeiner 1998, Brandeis et al. 2001, DeBell et al. 1997, Muir et al. 2002) (Zobrist and Hinkley 2005)”.

A more diversified array of microclimates, structures, substrates, and habitat would result, which would support well-distributed populations of riparian dependent plant, invertebrate, and vertebrate species.

5th Field Analysis

Short Term/Long Term

Because there would be no noticeable adverse impacts to habitat for riparian-dependant species at the site scale, there would be no change at the 5th field watershed scale in the short or long terms. Because of the relatively small size of the project, benefits would not be measurable at the 5th field watershed scale.

3.3 AFFECTED RESOURCES NOT ANALYZED IN DETAIL

Due to the lack of concern expressed by the Scoping respondents, adequacy of existing best-management practices and policy, and the limited intensity or scope of the effects on the affected resource, the items below are excluded from detailed comparative analysis.

Air Quality

Landing pile burning (if burning is necessary to reduce potential wild land fire intensity) would adhere to the Oregon Smoke Management Plan for limiting effects of particulate emissions. A post harvest assessment of the treatment areas would occur to determine whether landing piles would be burned.

Port-Orford cedar

The Slater Rocks analysis area is within the range of Port-Orford cedar (POC); therefore, all management activities would conform to the guidelines specified in the 2004 Final Supplemental Environmental Impact Statement (FSEIS) for Management of POC in

Southwest Oregon where applicable (USDI 2004). *Pytophthora lateralis* (PL) infections are found throughout the Slater Rocks Analysis Area on all land ownerships.

Risk

Areas within 50 feet of streams or roads were determined to be at high risk of infection by PL, and those areas greater than 50 feet away from roads and streams were determined to be at low risk of infection by PL (p.3&4-42). Throughout the entire analysis area 43,944 acres are at low risk. This amounts to 76% of the analysis area. Of those acres at low risk, 13,222 acres are on BLM-managed lands. This amounts to 78% of BLM property within the analysis area being at low risk of infection by PL.

The answer to all three questions in the Risk Key provided in the 2004 FSEIS (p.2-18) which gives direction for assessing risk and controlling spread of PL, was “no.” Risk is therefore deemed to be low and no additional POC management practices are required.

Action Being Taken

Although no additional mitigation is required, some measures to reduce the risk of further spread of PL would be implemented. To retain existing species diversity, all POC 7 inches DBH and greater would be retained. The three exceptions are: when a POC is closer than 25 feet to another POC, when a POC is within 50 feet of an existing road, and when a POC falls within a gap area. In these cases the POC would be cut to reduce risk of spread of PL. Management of POC would emphasize areas at low risk of infection (p.2-15).

Noxious Weeds

The BLM is required to develop a Noxious Weed Risk Assessment when it is determined that an action may introduce or spread noxious weeds or when known habitat exists (USDI 2007e). This assessment has been completed for the Slater Rocks project and is included in Appendix C. Prevention measures identified as a result of this assessment not already applied on District lands as part of routine activities (USDI 1997), have been incorporated into the Project Design Features to minimize the potential for introducing weeds to the project area and/or spreading existing weed infestations.

Hazardous Materials

Activity resulting from the Action Alternatives would be subject to State of Oregon Administrative Rule No. 340-108, *Oil and Hazardous Materials Spills and Releases*. This specifies the reporting requirements, cleanup standards, and liability that attaches to a spill or release or threatened spill or release involving oil or hazardous substances. Site monitoring for solid and hazardous waste would be performed in conjunction with normal contract administration. In addition, the Coos Bay District Hazardous Materials Contingency Plan and Spill Plan for Riparian Operations (USDI 2000) would apply when applicable to operations where a release threatens to reach surface waters or is in excess of reportable quantities.

Cultural Resources

Records compiled by the Oregon State Historic Preservation Office (SHPO) and the Coos Bay BLM District do not show archaeological sites within or near the vicinity of project

units. Timber harvest (clear-cutting) was previously accomplished in these units between 1948 and 1974. Subsequently, the units were replanted.

Because of the land-use history of these units, it is not anticipated that this project would impact intact cultural resources. As a Project Design Feature, potential cultural resources are discovered during work associated with this project, work should stop and the Myrtlewood Field Office cultural resource specialist would be contacted to provide clearance for work to resume.

Environmental Justice/ Native American Religious Concerns

The proposed areas of activity in connection with the Slater Rocks project are not known to be used by, or disproportionately used by, Native Americans and minority or low-income populations for specific cultural activities, or at greater rates than the general population. This includes their relative geographic location and cultural, religious, employment, subsistence, or recreational activities that may bring them to the proposed areas. Also, BLM concludes that no disproportionately high or adverse human health or environmental effects will occur to Native Americans, and minority or low-income populations as a result of the proposed actions.

3.4 UNAFFECTED RESOURCES

None of the following critical elements of the human environment are located within the project area or within a distance to be affected by implementation of either alternative:

- Areas of Critical Environmental Concern
- Farmlands, Prime or Unique
- Flood Plains (as described in Executive Order 11988)
- Wild and Scenic Rivers
- Wilderness values

CHAPTER IV. LITERATURE CITED

2007. Oregon State Forest Practices Rules. OAR-629.
- AmphibiaWeb. 2008. Information on amphibian biology and conservation. AmphibiaWeb, Berkley, California. <http://amphibiaweb.org/>
- Anderson, P. D., D. J. Larson, and S. S. Chan. 2007. Riparian Buffer and Density Management Influences on Microclimate of Young Headwater Forests of Western Oregon. *Forest Science* **53**(2): 254-269.
- Applegarth, J. S. 1994a. *Special status amphibians and reptiles of the Eugene district*. Dept. of Interior - Bureau of Land Management, Eugene, OR.
- Applegarth, J. S. 1994b. Wildlife surveying and monitoring methods - amphibians and reptiles of the Eugene district.
- Aubry, K. B., and J. C. Lewis. 2003. Extirpation and Reintroduction of fishers (*Martes pennanti*) in Oregon: Implications for their Conservation in the Pacific States. *Biological Conservation* **114**(1): 79-90.
- Bailey, J. D., C. Mayrsohn, P. S. Doescher, E. St. Pierre, and J. C. Tappeiner. 1998. Understory vegetation in old and young Douglas-fir forests of western Oregon. *Forest Ecology and Management* **112**: 289-302.
- Bailey, J. D., and J. C. Tappeiner. 1998. Effects of thinning on structural development in 40- to 100-year-old Douglas-fir stands in western Oregon. *Forest Ecology and Management* **108**: 99-113.
- Bailey, J. D., and J. C. Tappeiner. 2002. Trees, shrubs, and herbaceous vegetation. Pages 22-25 in P. S. Muir, R. L. Mattingly, J. C. Tappeiner, J. D. Bailey, W. E. Elliott, J. Hagar, D. Miller, E. B. Peterson, and E. E. Starkey, editors. *Managing for biodiversity in young Douglas-fir forests of Western Oregon*. U.S. Dept. of the Interior - U.S. Geological Survey - Forest and Rangeland Ecosystem Science Center (FRESO), Corvallis, OR. *Biological Science Report*
- Berris, S. N., and R. D. Harr. 1987. Comparative snow accumulation and subsequent melt during rainfall in forested and clearcut plots in western Oregon. *Water Resources Research* **23**(1): 135-142.
- Bosch, J. M., and J. D. Hewlett. 1982. A Review of catchment experiments to determine the effects of vegetation changes on water yield and evapotranspiration. *Journal of Hydrology* **55**: 3-23.
- Brake, D., M. Molnau, and J. King, G. 1997. Sediment transport distances and culvert spacings on logging roads within the Oregon coast mountain range. Pages Paper No. IM-975018 in *Proceedings, Annual International Meeting*. Minneapolis, MN. American Society of Agricultural and Biological Engineers (formerly American Society of Agricultural Engineers).
- Brian, N. J., J. Davis, J. Menten, E. Morgan, R. Orazem, M. Oxford, F. Price, T. Rodenkirk, and J. Sperling. 2002. Applications of Known Site Management Recommendations for Survey and Manage Nonvascular Species on the Coos Bay District. U.S. Dept. of the Interior - Bureau of Land Management, North Bend, OR.
- Bunnell, F. L., I. Houde, B. Johnston, and E. Wind. 2002. How Dead Trees Sustain Live Organisms in Western Forests. Pages 291-318 in W. F. Laudenslayer, P. J. Shea, B. E. Valentine, C. P. Weatherspoon, and T. E. Lisle, editors. *Proceedings of the Symposium on the Ecology and Management of Dead Wood in Western Forests*. Pacific Southwest Research Station, Reno, Nevada. *General Technical Report PSW-GTR-181*
- Burger, A. 2001. Using Radar to Estimate Populations and Assess Habitat Associations of Marbled Murrelets. *Journal of Wildlife Management* **65**(4): 696-715.
- Busby, P. E., P. Adler, T. L. Warren, and F. J. Swanson. 2006. Fates of live trees retained in forest cutting units, western Cascade Range, Oregon. *Canadian Journal of Forest Research* **36**(10): 2550-2560.
- Buskirk, S. W., and R. A. Powell. 1994. Habitat Ecology of Fishers and American Marten. Pages 283-296 in S. W. Buskirk, A. S. Harestad, M. G. Raphael, and R. A. Powell, editors. *Martens, Sables, and Fishers: Biology and Conservation*. Cornell University Press, Ithaca, N.Y.
- Campbell, L. A., W. J. Zielinski, and D. C. Macfarlane. 2000. A Risk Assessment for Four Forest Carnivores in the Sierra Nevada Under Proposed Forest Service Management Activities. Unpublished report. Sierra Nevada Framework Project.
- Carey, A. B., S. P. Horton, and B. L. Biswell. 1992. Northern spotted owls: Influence of prey base and landscape character. *Ecological Monographs* **6**(2): 223-250.
- Chan, S. S., P. Anderson, J. Cissel, L. Larson, and C. Thompson. 2004. Variable density management in Riparian Reserves: lessons learned from an operational study in manage forests of western Oregon, USA. *Forest Snow and Landscape Research* **78**(1/2): 151-172.

- Cushman, K., and R. Huff. 2007. The Conservation Assessment for Fungi Included in Forest Service Regions 5 and 6 Sensitive and BLM California, Oregon and Washington Special Status Species Programs. *Conservation Assessment*. U.S. Dept. of Agriculture - Forest Service Regions 5 and 6, Oregon and Washington, U.S. Dept. of the Interior - Bureau of Land Management, California, Oregon and Washington, Portland, OR. <http://www.fs.fed.us/r6/sfpnw/issssp/documents/planning-docs/ca-fu-text-2007-07-10-doc.doc>
- Dietrich, W. E., Dunne, T., Humphrey, N., and Reid, L. 1982. Construction of sediment budgets for drainage basins. Pages 2-23 in F. J. Swanson, R. J. Janda, T. Dunne, and D. N. Swanson, editors. Workshop on sediment budgets and routing in forested drainage basins. Portland, OR. U.S. Dept. of Agriculture - Forest Service - Pacific Northwest Forest and Range Experiment Station,.
- Drew, T. J., and J. W. Flewelling. 1979. Stand density management: an alternative approach and its application to Douglas-fir plantations. *Forest Science* **25**(3): 518-532.
- Everest, F., and G. H. Reeves. 2006. Riparian and Aquatic Habitats of the Pacific Northwest and Southeast Alaska: Ecology, Management History, and Potential Management Strategies. PNW-GTR-692, *General Technical Report*. U.S. Dept. of Agriculture - Forest Service - Pacific Northwest Research Station, Portland, OR. http://www.fs.fed.us/pnw/pubs/pnw_gtr692.pdf
- Everest, F. H., B. L. Beschta, J. C. Scrivner, K. V. Koski, J. R. Sedell, and C. J. Cedarholm. 1987. Fine sediment and salmonid production: a paradox. *Streamside Management: Forestry and Fishery Interactions* **57**: 98-142.
- Fahey, R. T., and K. J. Puettmann. 2007. Ground-layer disturbance and initial conditions influence gap partitioning of understory vegetation. *Journal of Ecology* **95**: 1098-1109.
- FEMAT. 1993. Forest Ecosystem Management: An Ecological, Economic, and Social Assessment. GPO 1993-793-071, FEMAT, Forest Ecosystem Management Assessment Team (FEMAT), Washington DC. http://www.or.blm.gov/nwfpnepa/FEMAT-1993/1993_%20FEMAT_Report.pdf
- Franklin, J. F. 1977. Effects of uneven-aged management on species composition. Pages 64-70 in *Uneven-aged Silviculture and Management in the Western United States*. Proceedings of In-Service Workshop, Redding CA, October 19-21, 1976. Timber Management Research, USDA Forest Service.
- Franklin, J. F., T. A. Spies, R. VanPelt, A. B. Carey, D. A. Thornburgh, D. R. Berg, D. B. Lindenmayer, M. E. Harmon, W. S. Keeton, D. C. Shaw, K. Bible, and J. Chen. 2002. Disturbances and structural development of natural forest ecosystems with silvicultural implications, using Douglas-fir forests as an example. *Forest Ecology and Management* **155**: 399-423.
- Greenberg, J., and K. F. Welch. 1998. Hydrologic Process Identification for Western Oregon. Boise Cascade Co, Boise, ID.
- Grenier, J. J., and K. Nelson. 1995. Marbled Murrelet Habitat Associations in Oregon. Pages 191-204 in *Ecology and Conservation of the Marbled Murrelet*. U.S. Dept. of Agriculture - Forest Service, Albany, CA
- Hagar, J., and S. Howlin. 2001. Songbird Community Response to Thinning of Young Douglas-fir Stands in the Oregon Cascades - Third Year Post-treatment Results for the Willamette N.F., Young Stand Thinning and Diversity Study. Cascade Center for Ecosystem Management, Corvallis OR. <http://www.fsl.orst.edu/iter/research/related/ccem/yst/pubs/POSTYR3.pdf>
- Harr, R. D. 1986. Effects of clearcutting on rain-on-snow runoff in Western Oregon: A new look at old studies. *Water Resource Research* **22**(7): 1095-1100.
- Harr, R. D., and B. A. Coffin. 1992. Influence of timber harvest on rain-on-snow runoff: a mechanism for cumulative watershed effects. *American Institute of Hydrology*: 455-469.
- Harris, D. D., L. L. Hubbard, and L. E. Hubbard. 1979. Magnitude and Frequency of Floods in Western Oregon. *Open-File Report* 79-553. U.S. Dept. of the Interior - U.S. Geological Survey, Denver, CO. <http://pubs.er.usgs.gov/usgspubs/ofr/ofr79553>
- Hayes, J. R., S. S. Chan, W. H. Emmingham, J. C. Tappeiner, L. D. Kellogg, and J. D. Bailey. 1997. Wildlife Response to Thinning Young Forests in the Pacific Northwest. *Journal of Forestry* **91**(8): 28-33.
- Henson, P., and T. A. Grant. 1991. The Effects of Human Disturbance on Trumpeter Swan Breeding Behavior. *Wildlife Society Bulletin* **19**(3): 248-257.
- Huff, M. H., M. G. Raphael, S. L. Miller, S. K. Nelson, and J. Baldwin. 2006. Northwest Forest Plan - The First Ten Years (1994-2003): status and trends of populations and nesting habitat for the Marbled Murrelet. PNW-GTR-650, *General Technical Report*. U.S. Dept. of Agriculture, Forest Service, Pacific Northwest Research Station, Portland, OR. <http://www.treeseearch.fs.fed.us/pubs/23161>

- Irwin, L. L. D., D. Rock, and S. Rock. 2000. Adaptive Management Monitoring of Northern Spotted Owls. Annual Progress Report. National Council for Air and Stream Improvement, Corvallis OR.
- Isaacs, F. B., R. G. Anthony, and R. J. Anderson. 1983. Distribution and productivity of nesting bald eagles in Oregon, 1978-1982. *The Murrelet* **64**: 33-38.
- Janes, S. W. 2003,2006. Black-throated Gray Warbler. Pages 512-513 in D. B. Marshall, M. G. Hunter, and A. L. Contreras, editors. *Birds of Oregon: A General Reference*. Oregon State University Press, Corvallis OR
- Kindschy, R. R., and D. B. Marshall. 2003,2006. Mourning Dove. Pages 304-305 in D. B. Marshall, M. G. Hunter, and A. L. Contreras, editors. *Birds of Oregon: A General Reference*. Oregon State University Press, Corvallis OR
- Laudenslayer, W. F., P. J. Shea, B. E. Valentine, C. P. Weatherspoon, and T. E. Lisle. 2002. Proceedings of the Symposium on the Ecology and Management of Dead Wood in Western Forests. in Symposium on the Ecology and Management of Dead Wood in Western Forests. Reno, Nevada. Pacific Southwest Research Station.
- Long, J. N., F. W. Smith, and D. R. M. Scott. 1981. The role of Douglas-fir stem sapwood and heartwood in the mechanical and physiological support of crowns and development of stem form. *Canadian Journal of Forest Research*(11): 459-646.
- Lonsdale, W. M., and A. R. Watkinson. 1982. Light and self thinning. *New Phytologist* **90**(3): 431-445.
- Martinson, E. J., and P. N. Omi. 2002. Performance of Fuel Treatments Subjected to Wildfires. Pages 7-14 in P. N. Omi and L. A. Joyce, editors. Conference on Fire, Fuel Treatments, and Ecological Restoration. Proc. RMRS-P-29. Fort Collins, CO. U.S. Dept. of Agriculture, Forest Service, Rocky Mountain Research Station.
- Meehan, W. R. 1991. *Influences of Forest and Rangeland Management on Salmonid Fishes and Their Habitat*. American Fisheries Society & U.S. Dept of Agriculture - Forest Service, Portland, OR.
- Meyer, C. B., M. D. Sparkman, and B. A. Klatte. 2005. Sand Seals in Coho Salmon Redds: Do They Improve Egg Survival? *North American Journal of Fisheries Management* **25**(1): 105-121.
- Moore, J. A., and J. R. Miner. 1997. Stream Temperatures, Some Basic Considerations. Oregon State University Extension Service, Corvallis, OR.
- Muir, P. S., R. L. Mattingly, J. C. Tappeiner, J. D. Bailey, W. E. Elliott, J. C. Hagar, J. C. Miller, E. B. Peterson, and E. E. Starkey. 2002. Managing for biodiversity in young Douglas-fir forests of Western Oregon. Biological Science Report. USGS/BRD/BSR-2002-0006, R. L. Mattingly, U.S. Dept. of the Interior - U.S. Geological Survey - Forest and Rangeland Ecosystem Science Center (FRESC), Corvallis, OR.
- NatureServe. 2008. Comprehensive Species Report - *Rana boylei*.
<http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Rana+boylei>
- Nelson, S. K., and A. K. Wilson. 2002. Marbled Murrelet Habitat Characteristics on State Lands in Western Oregon. Final Rep., OR Coop. Fish and Wildlife Research Unit, Oregon State Univ., Dept. of Fisheries and Wildlife, Corvallis, OR.
- Nussbaum, R. A., E. Brodie, and R. M. Storm. 1983. *Amphibians and reptiles of the Pacific northwest*. University Press of Idaho, Moscow, ID.
- ODEQ. 2006. Oregon's 2004/2006 Integrated Report Database.
<http://www.deq.state.or.us/wq/assessment/rpt0406.htm>
- ODFW. 2005. Volume I Species Management Unit Summaries. *2005 Oregon Native Fish Status Report*. Oregon Dept. of Fish and Wildlife - Fish Division, Salem, OR.
<http://www.dfw.state.or.us/fish/ONFSR/report.asp>
- Oliver, C. D. 1981. Forest development in North America following major disturbance. *Forest Ecology and Management* **3**: 153-168.
- Olson, D. H., and R. J. Davis. 2007. Conservation Assessment for the Foothill yellow-legged frog in Oregon (*Rana boylei*) v. 1.0. *Conservation Assessment*. U.S. Dept. of Agriculture - Forest Service Region 6, U.S. Dept. of the Interior - Bureau of Land Management, Portland, OR.
<http://www.fs.fed.us/r6/sfpnw/issssp/planning-documents/assessments.shtml>
- Patterson, M. 2003,2006. Rufous Hummingbird. Pages 346-348 in D. B. Marshall, M. G. Hunter, and A. L. Contreras, editors. *Birds of Oregon: A General Reference*. Oregon State University Press, Corvallis OR
- Peterson, E. B. 2002. Macrolichens on trees and shrubs: Managing for biodiversity in young Douglas-fir forests of Western Oregon. Pages 26-28 in P. S. Muir, R. L. Mattingly, J. C. Tappeiner, J. D. Bailey, W. E. Elliott, J. Hagar, D. Miller, E. B. Peterson, and E. E. Starkey, editors. *Managing for biodiversity in*

- young Douglas-fir forests of Western Oregon. U.S. Dept. of the Interior - U.S. Geological Survey - Forest and Rangeland Ecosystem Science Center (FRESC), Corvallis, OR. *Biological Science Report*
- Peterson, E. B., and B. McCune. 2001. Diversity and succession of epiphytic macrolichen communities in low-elevation managed conifer forests in Western Oregon. *Journal of Vegetation Science* **12**(511-524).
- Pilz, D., J. H. Mayo, and R. Molina. 2002. Chanterelle Mushroom Productivity Responses to Young Stand Thinning. *in* Silvicultural Options for Sustainable Management of Pacific Northwest Forest Symposium. Corvallis, OR. Oregon State University.
- Poage, N. J., and J. C. Tappeiner. 2002. Long-term patterns of diameter and basal area growth of old-growth Douglas-fir in western Oregon. *Canadian Journal of Forest Research* **32**: 1232-1243.
- Poggi, D., A. Porporato, L. Ridolfi, J. Albertson, and G. Katul. 2004. The effect of vegetation density on canopy sub-layer turbulence. *Boundary-Layer Meteorology* **111**: 565-587.
- Powell, R. A., and W. J. Zielinski. 1994. Fisher. Pages 184 *in* L. F. Ruggiero, K. B. Aubry, S. W. Buskirk, L. J. Lyon, and W. J. Zielinski, editors. *The Scientific Basis for Conserving Forest Carnivores: Marten, Fisher, Lynx, and Wolverine in the Western United States*. U.S. Dept. of Agriculture - Forest Service - Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO
- Rambo, R. R., and P. S. Muir. 1998. Forest floor bryophytes of *Pseudotsuga menziesii* - *Tsuga heterophylla* stands in Oregon: Influence of substrate and overstory. *The Bryologist* **10**(1): 116-130.
- Rathburn, G. B., N. Siepel, and D. C. Holland. 1992. Nesting Behavior and Movements of Western Pond Turtles, *Clemmys marmorata*. *Southwestern Naturalist* **37**: 319-324.
- Reid, L. M., and T. Dunne. 1984. Sediment Production from Forest Road Surfaces. *Water Resources Research* **20**(11): 1753-1761.
- Roberts, S. D., C. A. Harrington, and K. R. Buermyer. 2007. Does variable-density thinning increase wind damage in conifer stands on the Olympic Peninsula? *Western Journal of Applied Forestry* **22**(4): 285-296.
- Rosso, A. 2002. Macrolichens and bryophytes on shrubs. Pages 29-32 *in* P. S. Muir, R. L. Mattingly, J. C. Tappeiner, J. D. Bailey, W. E. Elliott, J. Hagar, D. Miller, E. B. Peterson, and E. E. Starkey, editors. *Managing for biodiversity in young Douglas-fir forests of Western Oregon*. U.S. Dept. of the Interior - U.S. Geological Survey - Forest and Rangeland Ecosystem Science Center (FRESC), Corvallis, OR. *Biological Science Report*
- Sanders, T. A. 1999. Habitat availability, dietary mineral supplement, and measuring abundance of Band-tailed Pigeons in western Oregon. Ph D. dissertation. Oregon State University, Corvallis OR.
- Satterlund, D. R., and P. W. Adams. 1992. *Wildland Watershed Management*. John Wiley & Sons, New York.
- Sauer, J. R., J. E. Hines, and J. Fallon. 2007. The North American Breeding Bird Survey, Results and Analysis 1966 - 2006 (v. 6.2.2006). U.S. Dept. of the Interior - U.S. Geological Survey - Patuxent Wildlife Research Center, Laurel, MD. <http://www.mbr-pwrc.usgs.gov/bbs/>
- Smith, D. M. 1962. *The Practice of Silviculture*, 7th edition. John Wiley & Sons, Inc., New York, NY.
- Solis, D. M., and R. J. Gutierrez. 1990. Summer Habitat Ecology of Northern Spotted Owls in Northwestern California. *The Condor* **92**: 739-748.
- Spies, T. A., and J. F. Franklin. 1991. The structure of natural young, mature and old-growth Douglas-fir forests in Oregon and Washington. Pages 93-122 *in* L. F. Ruggiero, K. B. Aubry, A. B. Carey, and M. H. Huff, editors. *Wildlife and Vegetation of Unmanaged Douglas-fir Forests*. U.S. Dept. of Agriculture - Forest Service - Pacific Northwest Research Station, Corvallis, OR. *General Technical Report*
- Spies, T. A., J. F. Franklin, and M. Klopsch. 1990. Canopy gaps in Douglas-fir forests of the Cascade mountains. *Canadian Journal of Forest Research* **20**: 649-658.
- Streamnet GIS Data. 2003. Metadata for Pacific Northwest Coho Salmon fish distribution spatial data set. Streamnet, Portland, OR. <http://www.streamnet.org/online-data/GISdata.html>
- Tappeiner, J. C., D. Huffman, D. Marshall, T. A. Spies, and J. D. Bailey. 1997. Density, ages and growth rates in old-growth and young-growth forests in coastal Oregon. *Canadian Journal of Forest Research* **27**: 938-648.
- Thomas, J. W., E. D. Forsman, J. B. Lint, E. C. Meslow, B. R. Noon, and J. Verner. 1990. A conservation strategy for the Northern Spotted Owl. Report to the Interagency Scientific Committee to Address the Conservation of the Northern Spotted Owl. U.S. Dept. of Agriculture - Forest Service, Portland, OR.
- Townsend, M. A., J. A. Pomeroy, and B. R. Thomas. 1977. Soil inventory of the Coos Bay District. U. S. Dept. of the Interior (USDI). U.S. Dept. of the Interior - Bureau of Land Management, North Bend, OR.

- USDA. 1993. Region 6: Interim Old-Growth Definitions. U.S. Dept. of Agriculture - Forest Service - Pacific Northwest Research Station, Portland, OR.
- USDA, and USDI. 1994a. Final - Supplemental Environmental Impact Statement on Management of Habitat for the Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl. *SEIS*. U.S. Dept. of Agriculture - Forest Service, U.S. Dept. of the Interior - Bureau of Land Management, Portland, OR. <http://www.or.blm.gov/nwfp.htm>
- USDA, and USDI. 1994b. Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl; Standards and Guidelines for Management of Habitat for Late-successional and Old-growth Forest Related Species within the Range of the Northern Spotted Owl. *Record of Decision*. U.S. Dept. of Agriculture - Forest Service, U.S. Dept. of the Interior - Bureau of Land Management, Portland, OR. <http://www.or.blm.gov/nwfp.htm>
- USDA, and USDI. 2004. Final - Supplemental Environmental Impact Statement Management of Port-Orford-Cedar in Southwest Oregon. *SEIS*. U.S. Dept. of Agriculture - Forest Service, U.S. Dept. of the Interior - Bureau of Land Management, Portland, OR.
- USDA, and USDI. 2007. Final - Supplement to the 2004 Supplemental Environmental Impact Statement To Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines. *SEIS*. U.S. Dept. of Agriculture - Forest Service, U.S. Dept. of the Interior - Bureau of Land Management, Portland, OR.
- USDA, USDI, and ODF. 2004. Southwest Oregon Fire Management Plan. U.S. Dept. of Agriculture - Forest Service, U.S. Dept. of the Interior - Bureau of Land Management, U.S. Dept. of the Interior - National Park Service, Oregon Department of Forestry, Oregon Department of Forestry - Coos Forest Protective Association, North Bend, OR.
- USDC. 2008. ESA Critical Habitat Designation for Oregon Coast Coho Salmon - February 2008. <http://www.nwr.noaa.gov/ESA-Salmon-Listings/Salmon-Populations/Alsea-Response/upload/OCC-CH-map.pdf>
- USDI. 1994. Final: Coos Bay District Proposed Resource Management Plan Environmental Impact Statement. U.S. Dept. of the Interior - Bureau of Land Management, North Bend, OR. <http://www.or.blm.gov/coosbay/rmp/index.htm>
- USDI. 1995. Coos Bay District Record of Decision and Resource Management Plan. *Resource Management Plan*. U.S. Dept. of the Interior - Bureau of Land Management, North Bend, OR. <http://www.or.blm.gov/coosbay/rmp/index.htm>
- USDI. 1997. A Proposal to Conduct an Integrated Noxious Weed Program on the Coos Bay District of the Bureau of Land Management. EA. OR120-97-11, *Environmental Assessment*. U.S. Dept. of the Interior - Bureau of Land Management, North Bend, OR.
- USDI. 1999. Upper Middle Fork Coquille Watershed Analysis. U.S. Dept. of the Interior - Bureau of Land Management - Roseburg District - South River Field Office, Roseburg, OR. <http://www.blm.gov/or/districts/roseburg/plans/files/UMFkCqWA.pdf>
- USDI. 2000. Safety and Health Handbook. U.S. Dept. of the Interior - Bureau of Land Management, North Bend, OR.
- USDI. 2001. South Fork Coos Watershed Analysis. U.S. Dept. of the Interior - Bureau of Land Management, North Bend, Oregon. <http://orcb3web1/PDFs/RevSFCqWA/Revised%20S.F.%20Coos%20Watershed/S.F.CoosWaterRev.htm>
- USDI. 2002. Western Oregon Districts Transportation Management Plan. U.S. Dept. of the Interior - Bureau of Land Management, Portland, OR.
- USDI. 2004. Record of Decision and Resource Management Plan Amendment for Management of Port-Orford-Cedar in Southwest Oregon, Coos Bay, Medford, and Roseburg Districts. *Record of Decision*. U.S. Dept. of the Interior - Bureau of Land Management, Portland, OR.
- USDI. 2007a. Middle Fork Coquille Watershed Analysis Version 1.1. U.S. Dept. of Interior - Bureau of Land Management - Coos Bay District - Myrtlewood Field Office, North Bend, OR.
- USDI. 2007b. National Bald Eagle Management Guidelines. U.S. Dept. of Interior - Fish and Wildlife Service. <http://www.fws.gov/migratorybirds/issues/BaldEagle/NationalBaldEagleManagementGuidelines.pdf>
- USDI. 2007c. Record of Decision for the Final Supplement to the 2004 Supplemental Environmental Impact Statement To Remove or Modify the Survey and Manage Mitigation Measure Standards and

- Guidelines from Bureau of Land Management Plans within the Range of the Northern Spotted Owl. *Record of Decision*. U.S. Dept. of the Interior - Bureau of Land Management, Portland, OR.
- USDI. 2007d. Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States. FES 07-21, *Programmatic Environmental Impact Statement*. U.S. Dept. of the Interior - Bureau of Land Management, Washington DC.
- USDI. 2007e. Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States. *Record of Decision*. U.S. Dept. of the Interior - Bureau of Land Management, Washington DC.
- Walter, S. T., and C. C. Maguire. 2005. Snags, cavity-nesting birds, and silvicultural treatments in western Oregon. *Journal of Wildlife Management* **69**(4): 1578-1591.
- Waters, T. F. 1995. *Sediment in Streams: Sources, Biological Effects, and Control*. American Fisheries Society Monograph 7, Bethesda, MD.
- Wilson, J. S., and C. D. Oliver. 2000. Stability and density management in Douglas-fir plantations. *Canadian Journal of Forest Research* **30**: 910-920.
- WPN. 1999. Oregon Watershed Assessment Manual. Governor's Watershed Enhancement Board - Watershed Professional Network (WPN), Salem, OR.
- Zielinski, W. J., R. L. Truex, G. A. Schmidt, F. V. Schlexer, K. N. Schmidt, and R. H. Barrett. 2004. Resting Habitat Selection by Fishers in California. *The Journal of Wildlife Management* **68**(3): 475-492.

CHAPTER V. LIST OF PREPARERS

Aimee E.B. Hoefs	Team Lead/Technical Writer-Editor
Paul Leman	Project Lead, Forester
Larry Standley	Hydrologist
James Heaney	Wildlife Biologist
Stephanie Messerle	Fish Biologist
Kevin McCabe	Soil Scientist
Tim Rodenkirk	Botanist
Jonathan Luhnnow	Port-Orford cedar
Stephan Samuels	Cultural Specialist/ Environmental Justice
Barry Hogge	Fuels Specialist
Ronald Shipp	Forest Engineer
Paul Gammon	Hazardous Materials Coordinator
Glenn Harkleroad	Noxious Weed Coordinator
Jay Flora	GIS Specialist

CHAPTER VI. LIST OF AGENCIES AND PERSONS CONTACTED

The public was notified of the planned EA through the publication of Coos Bay District's semi-annual *Planning Update*.

The following public agencies and interested parties were notified with scoping letters:

American Forest Resource Council	NW Environmental Defense Council
Association of O&C Counties	Oregon Wild
Bonneville Power Administration	Rogue Forest Protective Association
Cascadia Wildlands Project	SBA Timber Programs
Coast Range Association	Sierra Club, Many Rivers Group
Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians	Southern Oregon Timber Industries
Coquille Indian Tribe	Umpqua Watersheds
Department of Land Conservation and Development	U.S. Fish & Wildlife Service
Division of State Lands	Wildlife Management Institute
Douglas Timber Operators	Thirteen Adjacent Landowners
Friends of the Coquille	Two Private Citizens
Kalmiopsis Audubon Society	
Klamath-Siskiyou Wildland Center	
NOAA National Marine Fisheries Service	

APPENDIX A: ROAD WORK

Table A-1: New Road Construction

	EA Unit No	EA Spur No.	Summer Option Surface Type	Winter Option Surface Type	Summer Option Haul Season	Winter Option Haul Season	Summer Option Miles	Winter Option Miles	Summer Option Closure Type	Winter Option Closure Type
Mister Slate CT 08-34	SC14	SC14-1	Rock		All		0.04	0.00	Decommission	
	SC18	SC18-1	Dirt	Rock	Summer	Yes	0.15	0.15	Full Decommission	Decommission
		SC18-2	Rock		All		0.01	0.00	Decommission	
	SC22	SC22-1	Dirt		Summer		0.01	0.00	Full Decommission	
	TM01	TM01-1	Dirt		Summer		0.07	0.00	Full Decommission	
							0.28	0.15		
Rock Bottom 09-30	URC01	URC01-1	Dirt		Summer		0.12	0.00	Full Decommission	
	URC02	URC02-1	Dirt		Restricted		0.17	0.00	Full Decommission	
	URC02S	URC02S-1	Dirt		Restricted		0.32	0.00	Full Decommission	
		URC02S-2	Dirt		Restricted		0.06	0.00	Full Decommission	
		URC02S-3	Dirt		Restricted		0.04	0.00	Full Decommission	
							0.71	0.00		
Rocky Top 09-31	URC06	URC06-1	Dirt		Summer		0.59	0.00	Decommission	
	URC09W	URC09W-1	Dirt		Summer		0.09	0.00	Full Decommission	
	URC10	URC10-1	Dirt	Rock	Summer	Yes	0.07	0.07	Full Decommission	Decommission
		URC10-2	Dirt	Rock	Summer	Yes	0.09	0.09	Full Decommission	Decommission
	URC10N	URC10N-1	Dirt		Summer		0.06	0.00	Full Decommission	
							0.90	0.16		
Pink Panther 09-32	SC07	SC07-1	Dirt		Summer		0.17	0.00	Full Decommission	
	SC09	SC09-1	Dirt		Summer		0.06	0.00	Full Decommission	
		SC09-2	Dirt	Rock	Summer	Yes	0.05	0.05	Full Decommission	Decommission
		SC09-3	Dirt	Rock	Summer	Yes	0.08	0.08	Full Decommission	Decommission
	SC25N	SC25N-1	Dirt	Rock	Summer	Yes	0.06	0.06	Full Decommission	Decommission
		SC25N-2	Dirt	Rock	Summer	Yes	0.06	0.06	Full Decommission	Decommission
	SC25S	SC25S-1	Dirt	Rock	Summer	Yes	0.06	0.06	Full Decommission	Decommission
		SC25S-2	Dirt	Rock	Summer	Yes	0.10	0.10	Full Decommission	Decommission
	SC27	SC27-1	Dirt	Rock	Summer	Yes	0.29	0.29	Full Decommission	Decommission
		SC27-2	Rock		All		0.04	0.00	Decommission	
	SC31	SC31-1	Dirt		Summer		0.04	0.00	Full Decommission	
							1.01	0.70		
Busy Signal 09-32	HMF06	HMF06-1	Rock		All		0.13	0.00	Decommissioning	
							0.13	0.00		
Heavy Bone 09-34	SC02	SC02-1	Dirt		Restricted		0.33	0.00	Full Decommission	
		SC02-2	Dirt		Summer		0.22	0.00	Full Decommission	
	SC03	SC03-1	Dirt		Summer		0.23	0.00	Full Decommission	
	SC02S	SC101-1	Dirt		Summer		0.24	0.00	Full Decommission	
		SC101-2	Dirt		Summer		0.06	0.00	Full Decommission	
							1.08	0.00		

Table A-2: Road Renovation and Improvement

Sale Name	Road # of Existing Roads	EA Spur No.	Road work	Summer Option Surface Type	Winter Option Surface Type	Summer Option Haul Season	Winter Option Haul Season	Miles	Current status*	Summer/Winter Option closure type	Net Closure Miles
Mister Slate CT 08-34	unknown	SC13-1I	IMP	Rock	Rock	All	All	0.18	Open	None	0.00
	30-9-17.6	SC15-1R	RENO	Rock	Rock	All	All	0.06	Open	None	0.00
	30-9-21.2	SC17-1R	RENO	Rock	Rock	All	All	0.05	Open	None	0.00
	30-9-21.1	SC19-1R	RENO	Rock	Rock	All	All	0.18	Open	None	0.00
	30-9-21.6	SC19-2R	RENO	Rock	Rock	All	All	0.23	Open	None	0.00
	30-9-21.1	SC21-1R	RENO	Rock	Rock	Restricted	Restricted	0.24	Open	None	0.00
	unknown	SC22-1R	RENO	Dirt	Dirt	Summer	Summer	0.02	Open	Full	0.02
	unknown	TM02-1R	RENO	Dirt	Dirt	Summer	Summer	0.11	Unknown	Full	0.11
								1.07			0.13
Rock Bottom CT 09-30	29-10-35.7	URC01-1R	RENO	Rock	Rock	All	All	0.33	Open	None	0.00
	29-9-32.0	URC02-1R	RENO	Dirt	Dirt	Summer	Summer	0.58	Open	None	0.00
	29-10-35.5	URC17-1R	RENO	Rock	Rock	All	All	0.40	Closed	Decomm	0.00
	unknown	URC18-1I	IMP	Dirt	Rock	Summer	All	0.09	Unknown	Full / Decomm	0.09
	29-10-35.1	URC18-1R	RENO	Rock	Rock	Restricted	Restricted	0.65	Open	None	0.00
	29-10-35.9	URC19-1R	RENO	Dirt	Dirt	Restricted	Restricted	0.18	Unknown	None	0.00
	29-10-35.1	URC19-2R	RENO	Rock	Rock	Restricted	Restricted	0.20	Open	None	0.00
								2.43			0.09
Rocky Top CT 09-31	Unknown	URC06-1R	RENO	Dirt	Dirt	Summer	Summer	0.04	Unknown	Decomm	0.04
	Unknown	URC06-2R	RENO	Dirt	Dirt	Summer	Summer	1.01	Unknown	Full	1.01
	Unknown	URC06-3R	RENO	Dirt	Dirt	Summer	Summer	0.52	Unknown	Full	0.52
	29-9-21.0	URC06-4R	RENO	Rock	Rock	All	All	0.02	Open	None	0.00
	29-9-21.2	URC06-4R	RENO	Rock	Rock	All	All	0.16	Open	None	0.00
	Unknown	URC06-4R	RENO	Rock	Rock	All	All	0.11	Unknown	Decomm	0.11
	Unknown	URC07-1R	RENO	Dirt	Dirt	Summer	Summer	0.41	Unknown	Full	0.41
	unknown	URC09E-1R	RENO	Rock	Rock	All	All	0.19	Unknown	Decomm	0.19
	28-9-35.0	URC09W-1R	RENO	Rock	Rock	All	All	0.50	Open	None	0.00
	Unknown	URC09W-2R	RENO	Dirt	Dirt	Summer	Summer	0.12	Unknown	Full	0.12
	Unknown	URC09W-3R	RENO	Dirt	Dirt	Summer	Summer	0.08	Unknown	Full	0.08
	Unknown	URC10-1R	RENO	Rock	Rock	All	All	0.15	Unknown	Decomm	0.15
	Unknown	URC10-1R	RENO	Rock	Rock	All	All	0.10	Unknown	None	0.00
	Unknown	URC10-3R	RENO	Dirt	Rock	Summer	All	0.25	Unknown	Decomm	0.25
	Unknown	URC10-3R	RENO	Dirt	Rock	Summer	All	0.06	Unknown	None	0.00
	Unknown	URC10-4R	RENO	Dirt	Rock	Summer	All	0.10	Unknown	Full / Decomm	0.10

Sale Name	Road # of Existing Roads	EA Spur No.	Road work	Summer Option Surface Type	Winter Option Surface Type	Summer Option Haul Season	Winter Option Haul Season	Miles	Current status*	Summer/Winter Option closure type	Net Closure Miles
Rocky Top Cont'd	Unknown	URC10-5R	RENO	Dirt	Dirt	Summer	Summer	0.06	Unknown	Full	0.06
	28-9-35	URC10-6R	RENO	Rock	Rock	All	All	0.15	Open	Decomm	0.14
	Unknown	URC10-7R	RENO	Dirt	Dirt	Summer	Summer	0.11	Unknown	Full	0.11
	29-9-9.2	URC10-8R	RENO	Rock	Rock	All	All	0.22	Open	None	0.00
	29-9-9.0	URC10-9R	RENO	Rock	Rock	All	All	0.05	Open	None	0.00
	unknown	URC10-10R	RENO	Rock	Rock	All	All	0.06	Unknown	Decomm	0.06
	unknown	URC11-1R	RENO	Rock	Rock	All	All	0.04	Unknown	Decomm	0.04
	unknown	URC13-1R	RENO	Dirt	Dirt	Summer	Sumer	0.30	Unknown	Full	0.30
								4.81			3.69
Pink Panther CT 09-32	30-9-7.0	SC06-1R	RENO	Rock	Rock	Summer	Summer	0.37	Seasonal/Temporary	None	0.00
	unknown	SC08-1I	IMP	Rock	Rock	All	All	0.06	Unknown	Decomm	0.06
	unknown	SC09-1R	RENO	Rock	Rock	All	All	0.06	Unknown	Decomm	0.06
	30-9-8.0	SC26-1R	RENO	Dirt	Dirt	Summer	Summer	0.11	Seasonal / Temporary	Full	0.11
	30-9-7.3	SC27-1R	RENO	Rock	Rock	All	All	0.30	Open	None	0.00
	unknown	SC31-1R	RENO	Dirt	Dirt	Summer	Summer	0.18	Unknown	Full	0.18
								1.08			0.41
Busy Signal CT 09-33	29-9-33.0	HMF02-1I	IMP	Dirt	Dirt	Restricted	Restricted	0.05	Open	Full	0.05
	29-9-33.0	HMF02-1R	RENO	Dirt	Dirt	Restricted	Restricted	0.46	Open	Full	0.46
	29-9-33.3	HMF04-1R	RENO	Rock	Rock	All	All	0.41	Open	None	0.00
	unknown	HMF04-2R	RENO	Dirt	Dirt	Summer	Summer	0.25	Unknown	Full	0.25
	unknown	HMF04-3R	RENO	Dirt	Rock	Summer	All	0.09	Unknown	Decomm	0.09
	29-9-28.0	URC03-1R	RENO	Rock	Rock	All	All	0.69	Open	None	0.00
	29-9-29.3	URC04-1R	RENO	Dirt	Dirt	Restricted	Restricted	0.53	Decommissioned	Full	0.00
	29-9-29.0	URC04-2R	RENO	Dirt	Dirt	Restricted	Restricted	0.19	Open	Full	0.19
	29-9-28.0	URC04-3R	RENO	Dirt	Dirt	Summer	Summer	0.55	Open	None	0.00
								3.22			1.04
Heavy Bone CT 09-34	30-10-21.1	SC02-1R	RENO	Rock	Rock	Summer	Summer	1.49	Open	None	0.00
	30-10-9.0	SC02-2R	RENO	Rock	Rock	Summer	Summer	0.09	Open	None	0.00
	30-10-15.0	SC04-1I	IMP	Rock	Rock	All	All	0.30	Seasonal Closure	Decomm	0.30
	unknown	SC101-1R	RENO	Dirt	Dirt	Summer	Summer	0.29	Unknown	None	0.00
	30-10-9.0	SC101-1R	RENO	Rock	Rock	Summer	Summer	0.03	Open	None	0.00
								2.20			0.30
TOTAL								14.80			5.66

APPENDIX B: BOTANY

Table B-1: Vascular Plants within the project area that are suspected to occur, are Bureau Sensitive, and surveys are practical to complete.

*Scientific and Common Name	Habitat	Likelihood of Occurring in the Project Area
<i>Adiantum jordanii</i> (California maidenhair fern)	Perennial herb, moist shaded seeps, hillsides, or moist woods and forests, <1,200 m.	Moderate. Known from Bear Creek Rec. site T30S-R09W-9.
<i>Carex gynodynamis</i> (wonderwoman sedge)	Perennial, moist meadows and open forests, <600 m. There is one site on District.	Low. The habitat this species prefers is scarce in the proposed project area.
<i>Cimicifuga elata</i> var. <i>elata</i> (tall bugbane)	Perennial forb or herb, coniferous forest, north of Umpqua River, and east side of district, flowers June to early August.	Low. Present in the western hemlock forest association on Eugene and Roseburg BLM lands directly adjacent to Coos Bay BLM land.
<i>Erigeron cervinus</i> (Siskiyous daisy)	Perennial forb or herb; open, rocky slopes and streamsides, seeps, crevices in walls, meadows, pine to fir woodlands, chaparral, sometimes over serpentine, (50-900 to 2300 m; California and Oregon.	Low. The habitat this species prefers is scarce in the proposed project area.
<i>Iliamna latibracteata</i> (California globe mallow)	Perennial forb or herb, moist ground and stream banks, blooms June and July. There is one site on District.	Low. The only known site of this species on district is along the Big Creek mainline. It prefers areas with more light- openings in the forest, recent burns, roadsides, etc.
<i>Pellaea andromedifolia</i> (Coffee fern)	Perennial forb or herb, fern, rocky outcrops up to 5900 ft. There is one site on District.	Low. The habitat this species prefers is scarce in the proposed project area.
<i>Polystichum californicum</i> (California sword fern)	Perennial forb or herb, fern, woods, stream banks, shaded rocky outcrops. There are two sites on District	Low-Moderate. This species is rare on district but could potentially show up almost anywhere in the project area.
<i>Romanzoffia thompsonii</i> (Thompson's mist maiden)	Annual forb or herb, Mossy covered rock outcrops, 750 to 6,000 ft. There is one site on District.	Low. The habitat this species prefers is scarce in the proposed project area.
<i>Scirpus pendulus</i> (drooping bulrush)	Marshes, wet meadows, and ditches, 800 to 1,000 m, KM Ecoregion.	Low.
<i>Trillium kurabayashii</i> (= <i>T. angustipetalum</i>) (giant purple trillium)	Perennial forb, moist forest, montane coniferous forest, foothill woodland, and chaparral at 100 to 2,000 m, known from Grizzly Mountain and Colebrook Butte.	Low.

Table B-2: Non-Vascular plants within the project area that are suspected to occur, are Bureau Sensitive, and surveys are practical to complete.

Scientific Name	Plant Group	Habitat	Likelihood of Occurring in the Project Area
<i>Bryoria subcana</i>	lichen	Coastal forest and high precipitation summit. Several Coos Bay BLM sites; seems to prefer ridgelines.	High. One site located during surveys.
<i>Calicium adpersum</i>	lichen	Growing on bark on boles of old growth conifer trees.	Low. There are few legacy trees left on the project area.
<i>Diplophyllum plicatum</i>	liverwort	Tree boles of western hemlock and red cedar in riparian areas.	Low. There are several sites on district mainly in late-seral and old-growth stands.
<i>Heterodermia leucomela</i>	lichen	Sitka spruce and shore pine branches on forested headlands in the coastal fog zones, may also be found inland in riparian areas, moist valleys and fog-intercept ridges.	Low. Mostly found along immediate coast.
<i>Hypogymnia duplicata</i>	lichen	Mid-elevation moist western hemlock stands, old-growth Douglas-fir, mature western hemlock/Douglas-fir forest, moist Pacific silver fir or noble fir forests, Sitka spruce, riparian forest and later-successional forest along ridgetops in Oregon Coast Range, also occurs on red alder in sedge-spagnum bogs in Oregon Coast Range, elevation ranges from 1,100 to 5,450 feet.	Low.
<i>Hypotrachyna revoluta</i>	liverwort	Usually on bark and rarely on rock, Coast Range and immediate coast in OR, at Cape Arago, also from Rocky and Appalachian Mountains, east coast of Canada, Great Lakes area, and southwest border of US with Mexico.	Low. Mostly found along immediate coast.
<i>Leptogium cyanescens</i>	lichen	Tree bark of deciduous trees, but also occurs on juniper and western red cedar, decaying logs, and mossy rocks in cool, moist microsites, widely scattered. Location in CR Ecoregion in Lane & Lincoln Counties.	Low.
<i>Lobaria limita</i>	lichen	Mature to old growth forests, oak forests with rock outcrops, late-mature tan-oak and madrone forests, 1,800 to 6,700 ft; CR & WC Ecoregions	Low. Has been found as far south as Douglas Co.
<i>Metzgeria violacea</i>	liverwort	Hyper-maritime, on tree trunks, usually shaded, near coast; growing in dense mats or mixed among other bryophytes.	Low. Has been found at South and Catching Sloughs and inland on the Siuslaw NF
<i>Niebla cephalota</i>	lichen	Coastal habitats but may extend up to 15 miles inland where influenced by the coastal fog belt, occurs on exposed trees, shrubs, and less often on rocks, rock or bark; known from northern CA, Oregon coast (North Spit), and part of WA coast; CR Ecoregion.	Low. Has been found on the north spit of Coos Bay.
<i>Porella bolanderi</i>	liverwort	On outcrops and boulders (limestone, silica, serpentine, or sandstone), soil, and epiphytic on oaks, myrtlewood, bigleaf maple, Douglas-fir, Shasta red fir, redwood, and ponderosa pine; commonly at 100-750 m but known from 0 to 2,000 m; KM & WV Ecoregion.	Low.
<i>Schistostega pinnata</i>	moss	Mineral soil in shaded pockets of overturned tree roots, often with shallow pools of standing water at the base of the root wad; attached to rock or mineral soil around the entrance to caves, old cellars, and animal burrows; CR & WC Ecoregions.	Low.
<i>Tayloria serrata</i>	moss	Grows on humus and animal dung; KM, WV, & WC Ecoregions.	Low.
<i>Tetraphis geniculata</i>	moss	Found on down logs in late-seral conifer forests in W. OR and WA.	Low. Only a few pockets of remnant legacy trees on proposed thinning units although there is large down wood throughout the project area.

Table B-3: Fungi Species likely in project area, but not practical to Survey.

SPECIES	#of Known Sites- WA/OR/CA. Includes 2007 data	HABITAT REQUIREMENTS + # OF SITES ON COOS BAY BLM (as of 1/29/2008)	RANGE OF SPECIES (ORNHC 2004)
<i>Arcangiella camphorata</i>	13	Associated with pines, especially Douglas-fir and western hemlock, 200 to 950 m, March through November; known from Oregon (Benton, Coos, Curry, and Polk Counties), Washington (Clallam, Grays Harbor, and Jefferson Counties), British Columbia, and Mexico (State of Queretaro, under oaks); CR & KM Ecoregions and Washington. 11 sites known on Coos Bay BLM.	From the Siskiyou Mountains of S. Oregon north through the Coast Range to the Olympic Peninsula and in B.C.
<i>Boletus pulcherrimus</i>	26	West side Cascades in Lane County, sporocarps usually solitary in association with mixed conifer (grand fir, Douglas-fir) and hardwoods (tanoak) in coastal forests. One site on Coos Bay BLM.	Endemic to the Pacific Northwest from Washington south to CA.
<i>Cortinarius barlowensis</i> (= <i>C. azureus</i>)	26	Coastal to montane mixed coniferous forests up to 4,000 feet elevation with western hemlock, Pacific Silver fir, Sitka spruce, and Douglas-fir. No known sites on Coos Bay BLM.	Widely distributed in western WA & OR.
<i>Cudonia monticola</i>	32	Grows on spruce needles and coniferous debris; fruits in late summer and autumn; three sites on District including younger thinning units in the Burnt Ridge area.	Endemic to western North America.
<i>Gomphus kauffmanii</i>	72	Closely gregarious to caespitose, partially hidden in deep humus under Pinus and Abies sp. One site on district in a 50 yr. old Doug-fir plantation.	Endemic to western North America.
<i>Leucogaster citrinus</i>	57	Sub-surface soil. Roots of white fir, sub-alpine fir, shore pine, western white pine, Douglas-fir, and western hemlock. Seven known sites on Coos Bay BLM.	Endemic to the Pacific Northwest from Washington south to CA.
<i>Otidea smithii</i>	13	Exposed soil, duff, or moss under black cottonwood, Douglas-fir, and western hemlock; solitary to gregarious. No known sites on Coos Bay BLM.	Probably endemic to the Pacific North-west from Washington south to CA.
<i>Phaeocollybia californica</i>	53+10 = 63	40 year old plantations to >400 year old-growth forests, associated with the roots of Pacific silver fir, Douglas-fir, and western hemlock; fruits October-December; 10 sites on the Coos Bay district.	Endemic to the Pacific Northwest from Washington south to CA.
<i>Phaeocollybia olivacea</i>	47+10 = 57	40 year old plantations to >400 year old-growth forests, associated with the roots of Pacific silver fir, Douglas-fir, and western hemlock; fruits October-December; 29 sites on Coos Bay district one of which is in the Slater Rocks project area.	Endemic to the Pacific Northwest from Washington south to CA.
<i>Phaeocollybia pseudofestiva</i>	45+9 = 54	40 year old plantations to >400 year old-growth forests, associated with the roots of Pacific silver fir, Douglas-fir, and western hemlock; fruits October-December; 20 sites on Coos Bay district.	Endemic to the Pacific Northwest from Washington south to CA.
<i>Phaeocollybia sipei</i>	54+20 = 74	40 year old plantations to >400 year old-growth forests, associated with the roots of Pacific silver fir, Douglas-fir, and western hemlock; fruits October-December; 46 sites on district one of which is in the Slater Rocks project area.	Endemic to the Pacific Northwest from Washington south to CA.
<i>Phaeocollybia spadicea</i>	83+12 = 95	40 year old plantations to >200 year old old-growth Douglas-fir forests and in mature Sitka spruce stands in coastal lowlands regions; solitary to scattered to closely gregarious; fruits October-December; 40 sites on the Coos Bay District, three of which are on the Slater Rocks project area.	Endemic to the Pacific Northwest from Washington south to CA.
<i>Rhizopogon exiguus</i>	3	Coastal, known site at Mapleton, hypogeous fungi in coniferous forest; CR & KM Ecoregion. Fruits in March, August, September, and November. No known sites on Coos Bay BLM.	W. Oregon and the Washington Cascades.
<i>Sowerbyella rhenana</i>	73-1= 72 (one site destroyed on Coos Bay BLM)	Groups in duff of moist, undisturbed mature conifer forests, one collection from a tan oak stand in Curry County on Coos Bay BLM; CR & WC Ecoregions. Fruits October through December. One known site on Coos Bay BLM likely destroyed during hardwood conversion and subsequent burning operations.	To be expected across the cool North Temperate zone in Europe and Asia as well as N. America.

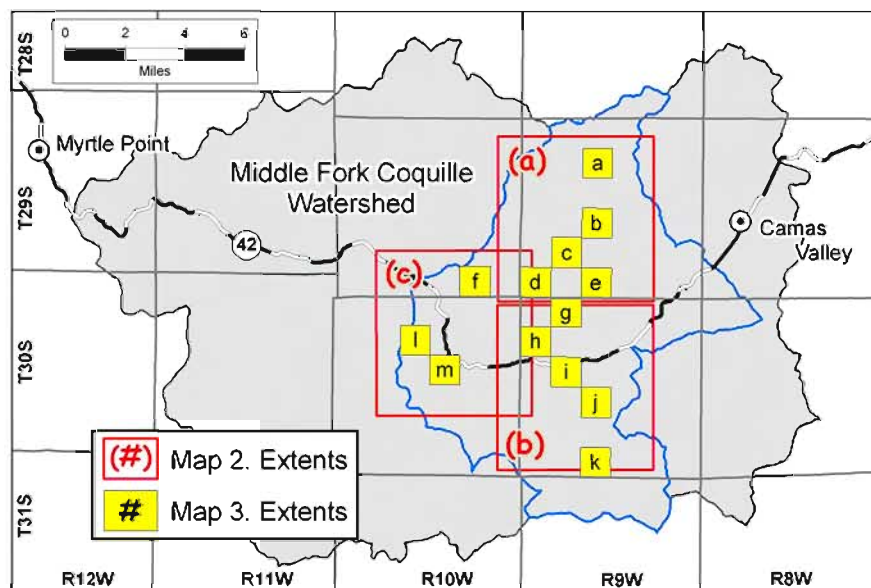
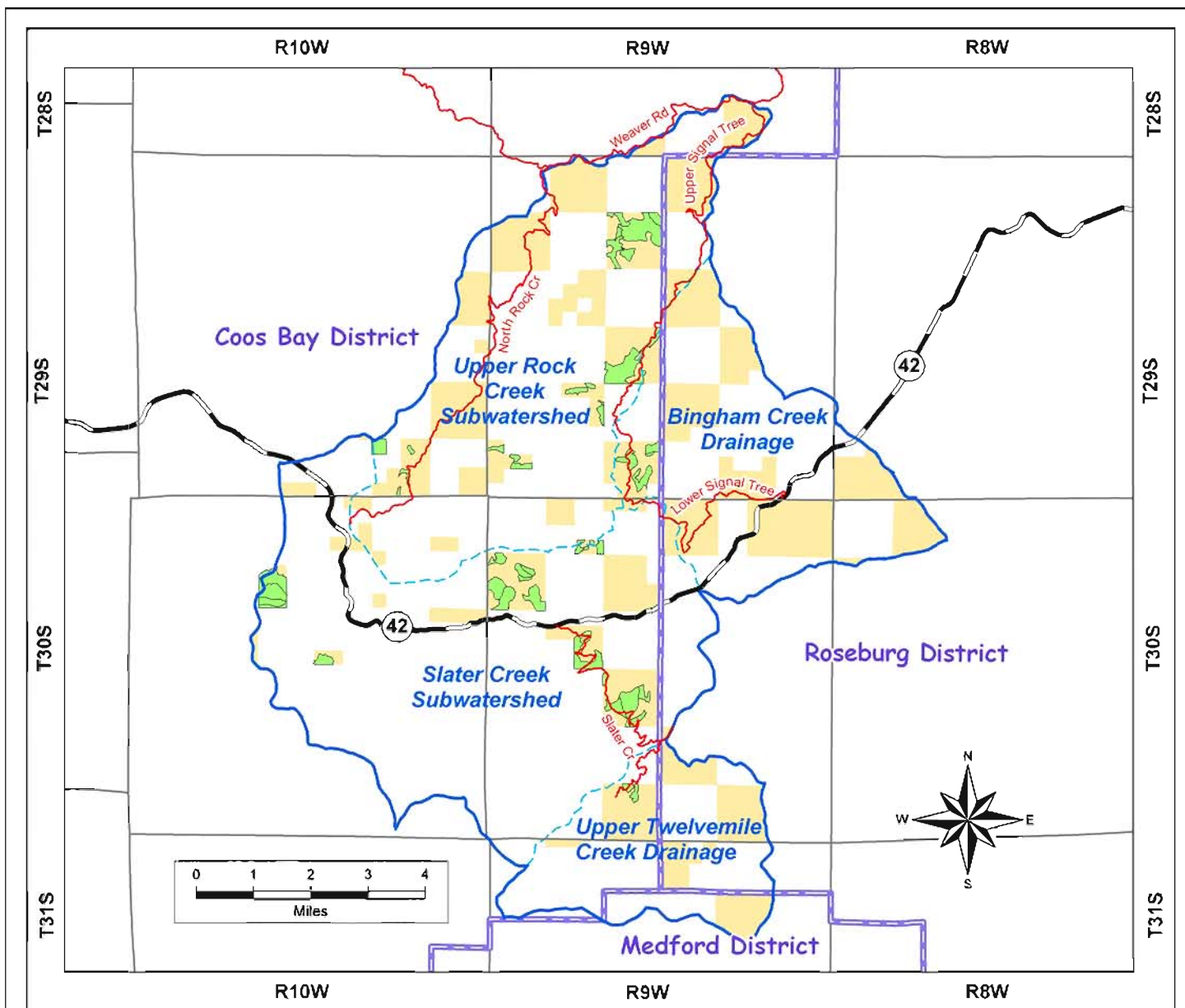
APPENDIX C: NOXIOUS WEED RISK ASSESSMENT

The BLM is required to develop a noxious weed risk assessment when it is determined that an action may introduce or spread noxious weeds or when known habitat exists. The following document is intended to satisfy this requirement and identify prevention measures that will minimize the potential for introducing weeds to the planning area and/or spreading weed infestations that already exist within the planning area.

Noxious Weed Risk Assessment

- 1) Does suitable habitat for noxious weeds exist in the planning area? **Yes.** If so, what are these areas? **Primarily road sides, landings, and areas of disturbed soil.**
- 2) May the actions proposed in the Slater Rocks EA introduce or spread noxious weeds within the planning area? **Yes.** What is the level of risk for spreading weeds via project activities? **Low to Medium. The specific prevention measures listed below will reduce the risk of spreading or introducing weeds within the planning area.**
- 3) What are the primary actions / conditions / vectors that may pose a risk of spreading weeds within the planning area? **Vehicle travel along forest roads and soil disturbance associated with project activities.**
- 4) What are the primary weeds of concern that may be found within or introduced to the planning area? **Scotch Broom, French Broom, Gorse, Himalayan. Blackberry, Meadow Knapweed, and Japanese Knotweed.**
- 5) Can actions be taken to avoid or minimize weed spread associated with project activities? **Yes.**
- 6) What actions can be taken to prevent or minimize the spread of weeds within the planning area? **See the specific prevention measures listed below.**
- 7) Have any high-risk sites been identified for treatment prior to project implementation? **No. Weed inventories and treatments are conducted by field office personnel on an annual basis. If any high-risk sites are identified, they will be treated using integrated pest management techniques as deemed necessary to prevent the spread or introduction of weeds within the planning area prior to project implementation.**
- 8) Are there any additional conditions or circumstances that need to be considered in relation to weed management within the planning area? **None have been identified.**

The specific prevention measures referred to above that are not already being implemented through other ongoing policies and procedures, have been incorporated into the Project Design Features located in Section 2.5.5, under Noxious Weeds.



Map Features

- Highway 42
- Primary Access Roads
- BLM District Boundary
- Drainage/Subwatershed Boundary
- Analysis Area Perimeter
- Unit Boundary
- BLM Administered Land in Analysis Area

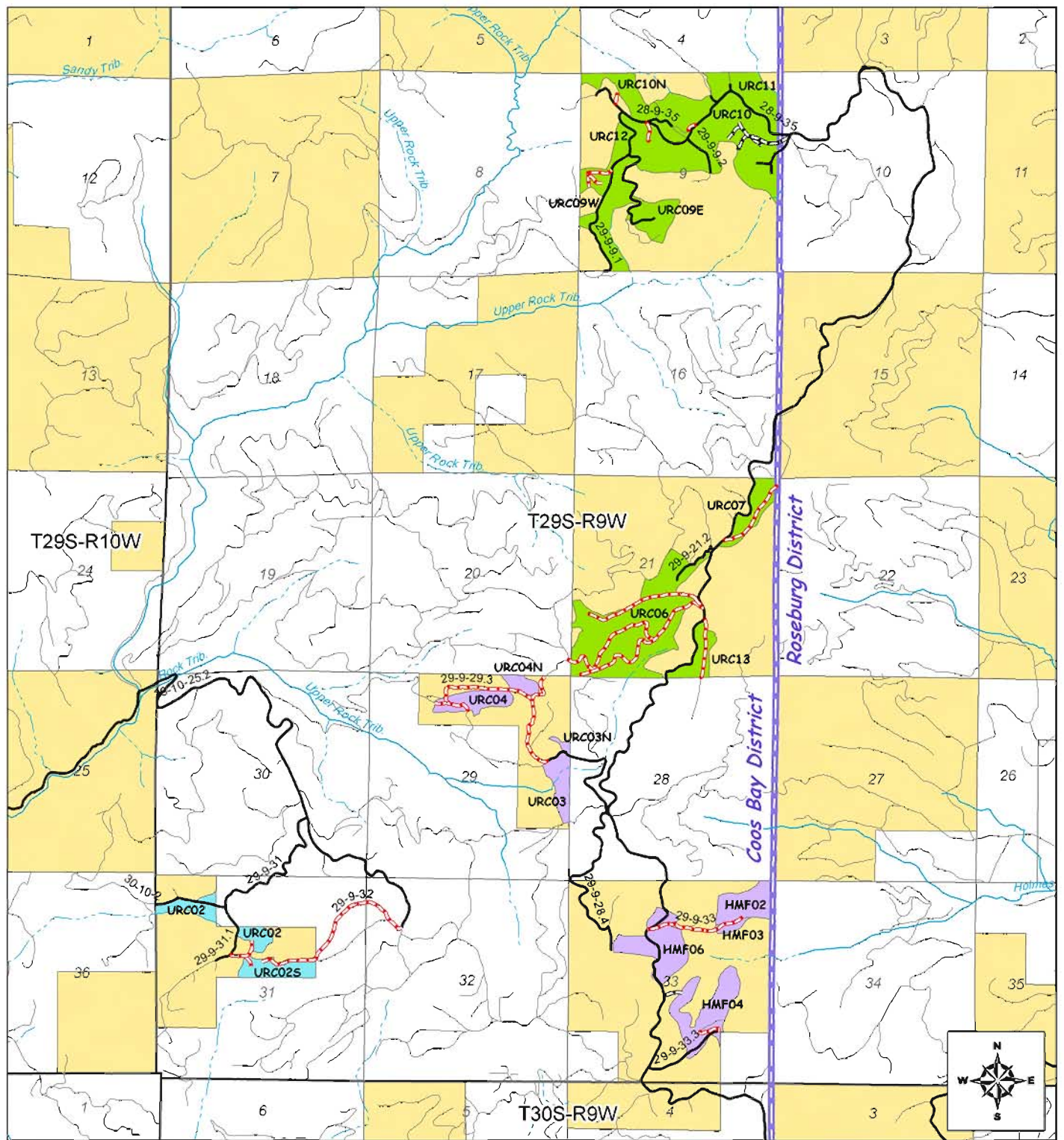
US DEPARTMENT OF THE INTERIOR Bureau of Land Management

Coos Bay District Office
Myrtlewood Resource Area
1300 Airport Lane
North Bend, OR 97459
Phone: (541) 756-0100
email: OR_CoosBay_Mail@blm.gov



No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data.

Map 1. General Vicinity - Slater Rocks EA



Map Features

(Not all map features necessarily occur in the area mapped above)

- | | | |
|--------------------|-----------------|-------------------------|
| Highway 42 | Busy Signal CT | Fishbearing Stream |
| Summer Haul | Heavy Bone CT | Non-Fishbearing Stream |
| All Season Haul | Mister Slate CT | BLM District Boundary |
| Haul Season Option | Pink Panther CT | BLM Administered Land |
| All Other Roads | Rock Bottom CT | Private/Other Ownership |
| | Rocky Top CT | |

US DEPARTMENT OF THE INTERIOR
Bureau of Land Management

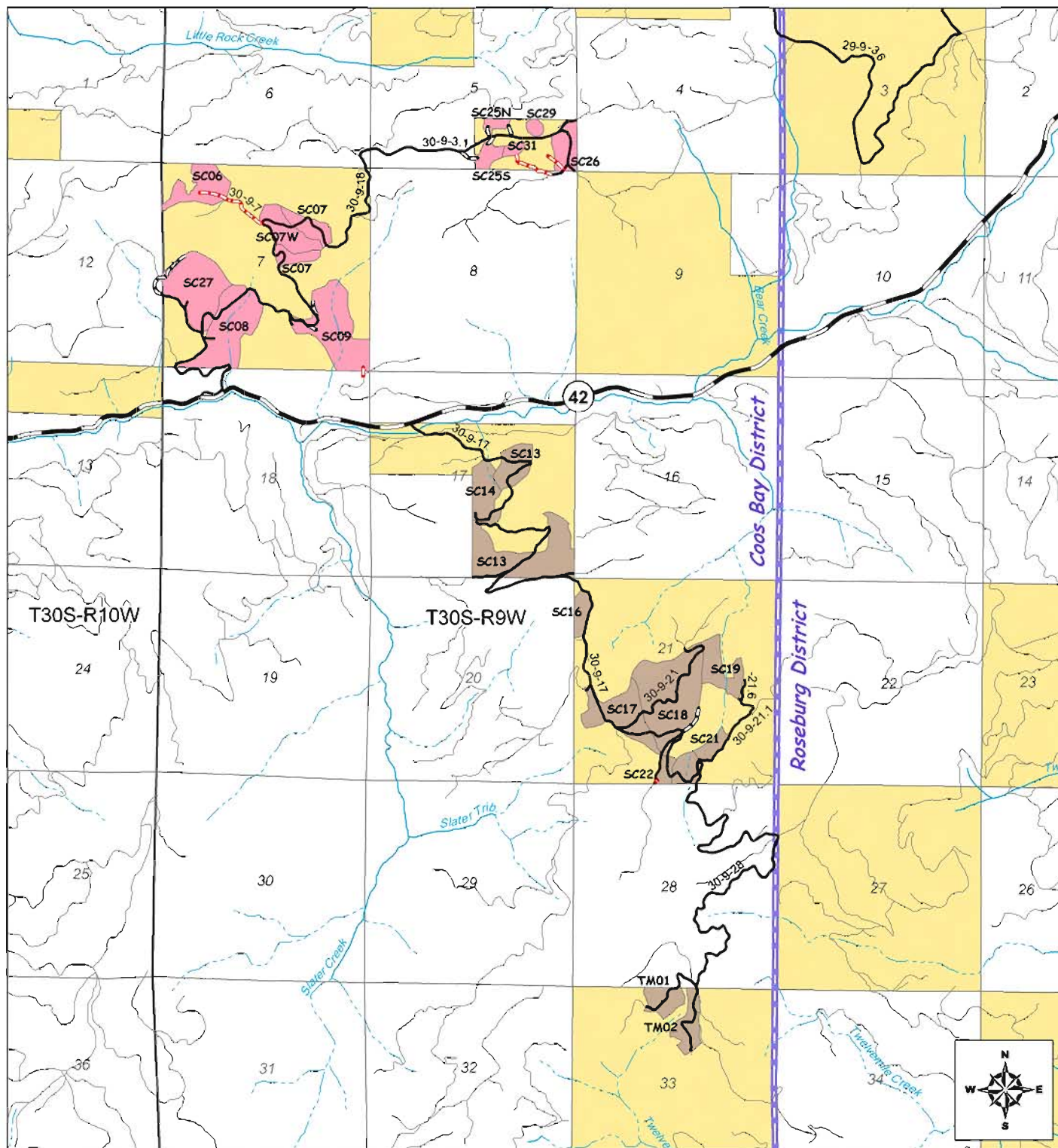
Coos Bay District Office
Myrtlewood Resource Area

Scale = 1:45,000



No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data.

Map 2(a). Unit Boundaries and Haul Season - Slater Rocks EA



Map Features

(Not all map features necessarily occur in the area mapped above)

- | | | |
|--------------------|-----------------|-------------------------|
| Highway 42 | Busy Signal CT | Fishbearing Stream |
| Summer Haul | Heavy Bone CT | Non-Fishbearing Stream |
| All Season Haul | Mister Slate CT | BLM District Boundary |
| Haul Season Option | Pink Panther CT | BLM Administered Land |
| All Other Roads | Rock Bottom CT | Private/Other Ownership |
| | Rocky Top CT | |

US DEPARTMENT OF THE INTERIOR
Bureau of Land Management

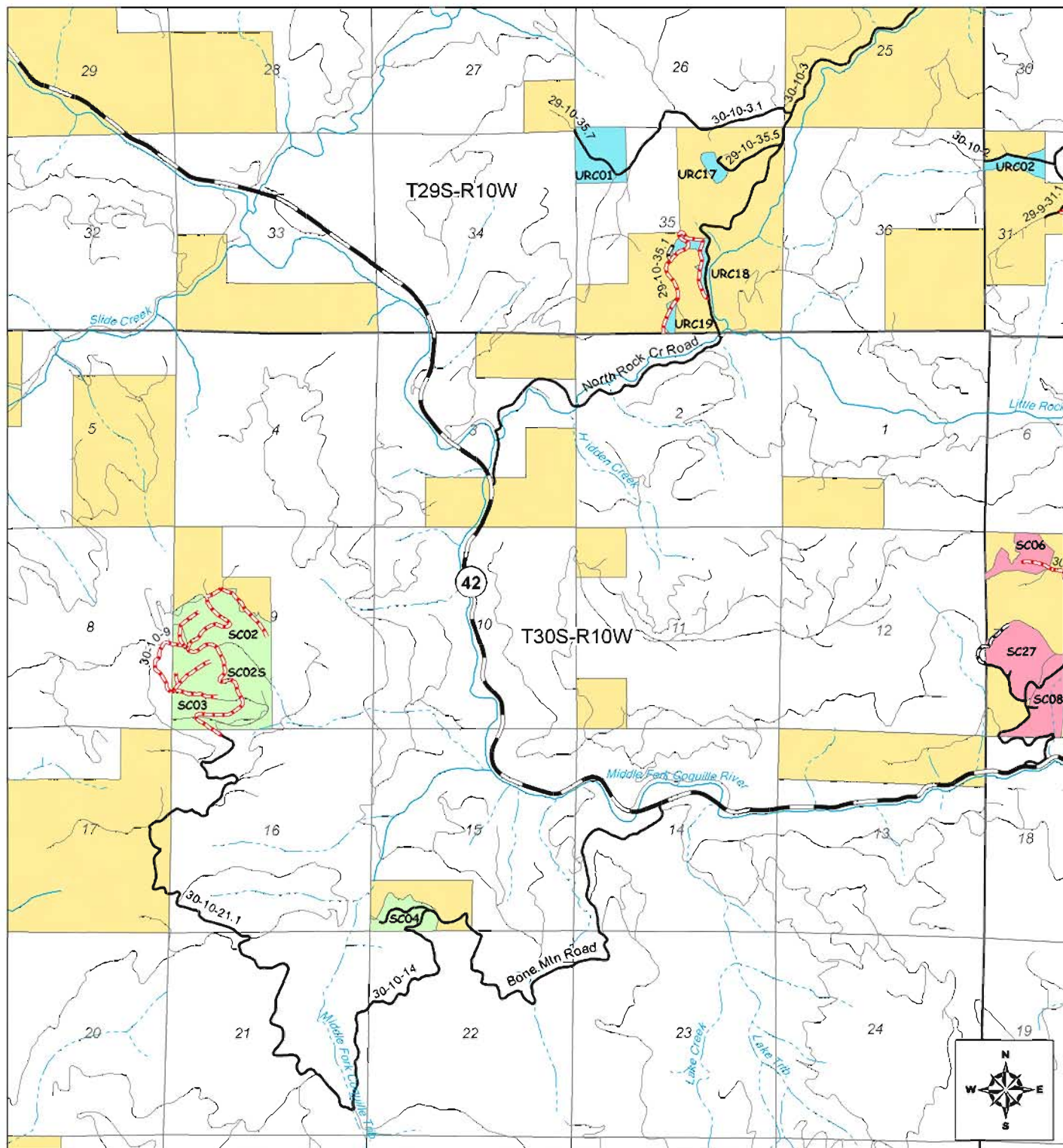
Coos Bay District Office
Myrtlewood Resource Area

Scale = 1:45,000



No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data.

Map 2(b). Unit Boundaries and Haul Season - Slater Rocks EA



Map Features

(Not all map features necessarily occur in the area mapped above)

- | | | |
|--------------------|-----------------|-------------------------|
| Highway 42 | Busy Signal CT | Fishbearing Stream |
| Summer Haul | Heavy Bone CT | Non-Fishbearing Stream |
| All Season Haul | Mister Slate CT | BLM District Boundary |
| Haul Season Option | Pink Panther CT | BLM Administered Land |
| All Other Roads | Rock Bottom CT | Private/Other Ownership |
| | Rocky Top CT | |

US DEPARTMENT OF THE INTERIOR
Bureau of Land Management

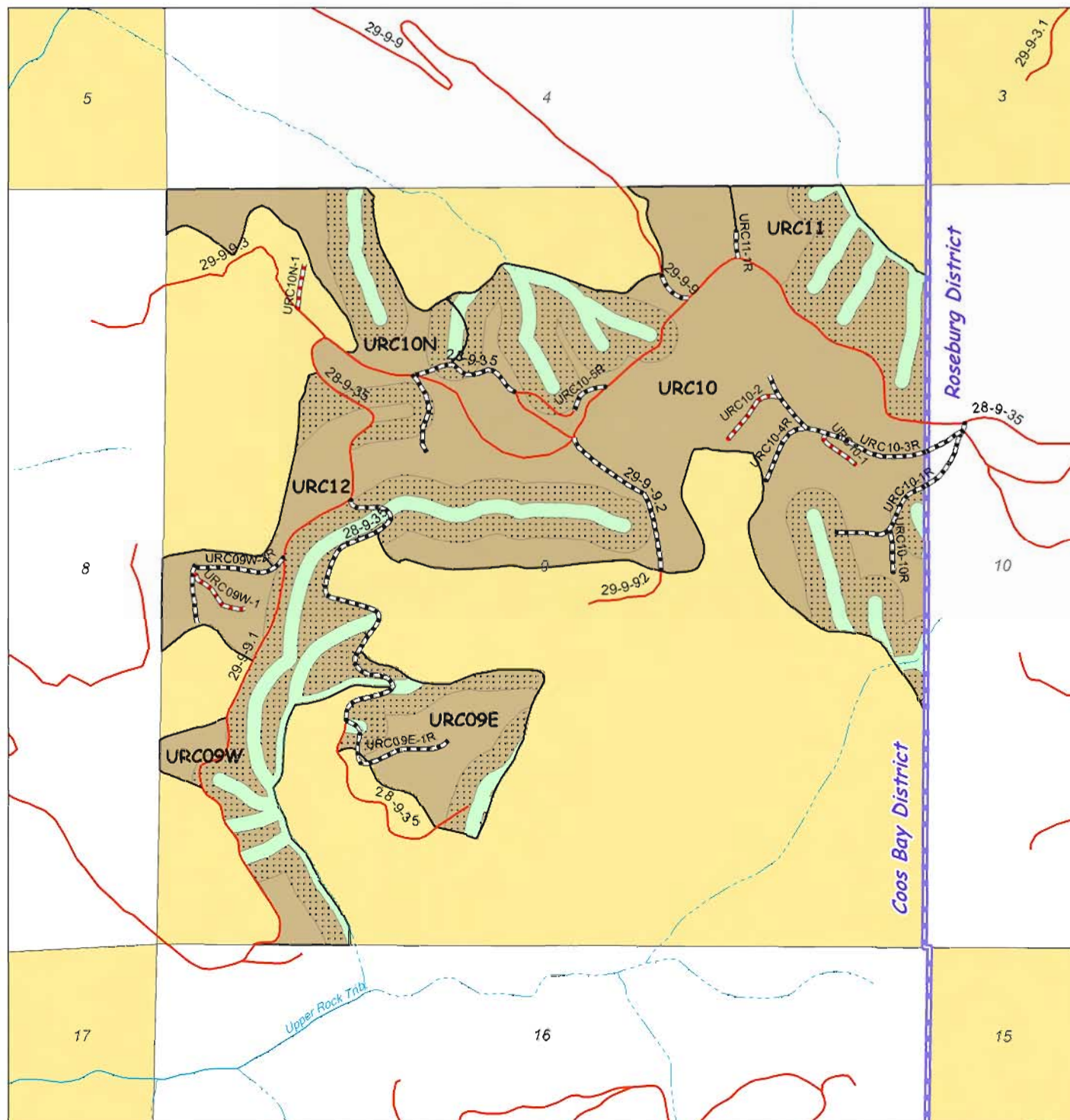
Coos Bay District Office
Myrtlewood Resource Area

Scale = 1:45,000



No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data.

Map 2(c). Unit Boundaries and Haul Season - Slater Rocks EA



T29S-R09W-Sec 09

Map Features

(Not all map features necessarily occur in the area mapped above.)

- | | |
|-----------------------|---------------------------|
| Highway 42 | Commercial Thinning Area |
| Road Improvement | No-Harvest Buffer |
| New Road Construction | Density Mgmt Area w/ Gaps |
| Road Renovation | Fishbearing Stream |
| All Other Roads | Non-Fishbearing Stream |
| BLM District Boundary | BLM Administered Land |
| | Private/Other Ownership |



US DEPARTMENT OF THE INTERIOR
Bureau of Land Management

Coos Bay District Office
Myrtlewood Resource Area

Scale = 1:12,000

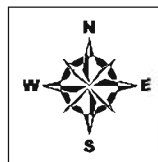
0 750 1,500
Feet

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data.

Map 3(a). Unit Treatments and Road Work - Slater Rocks EA

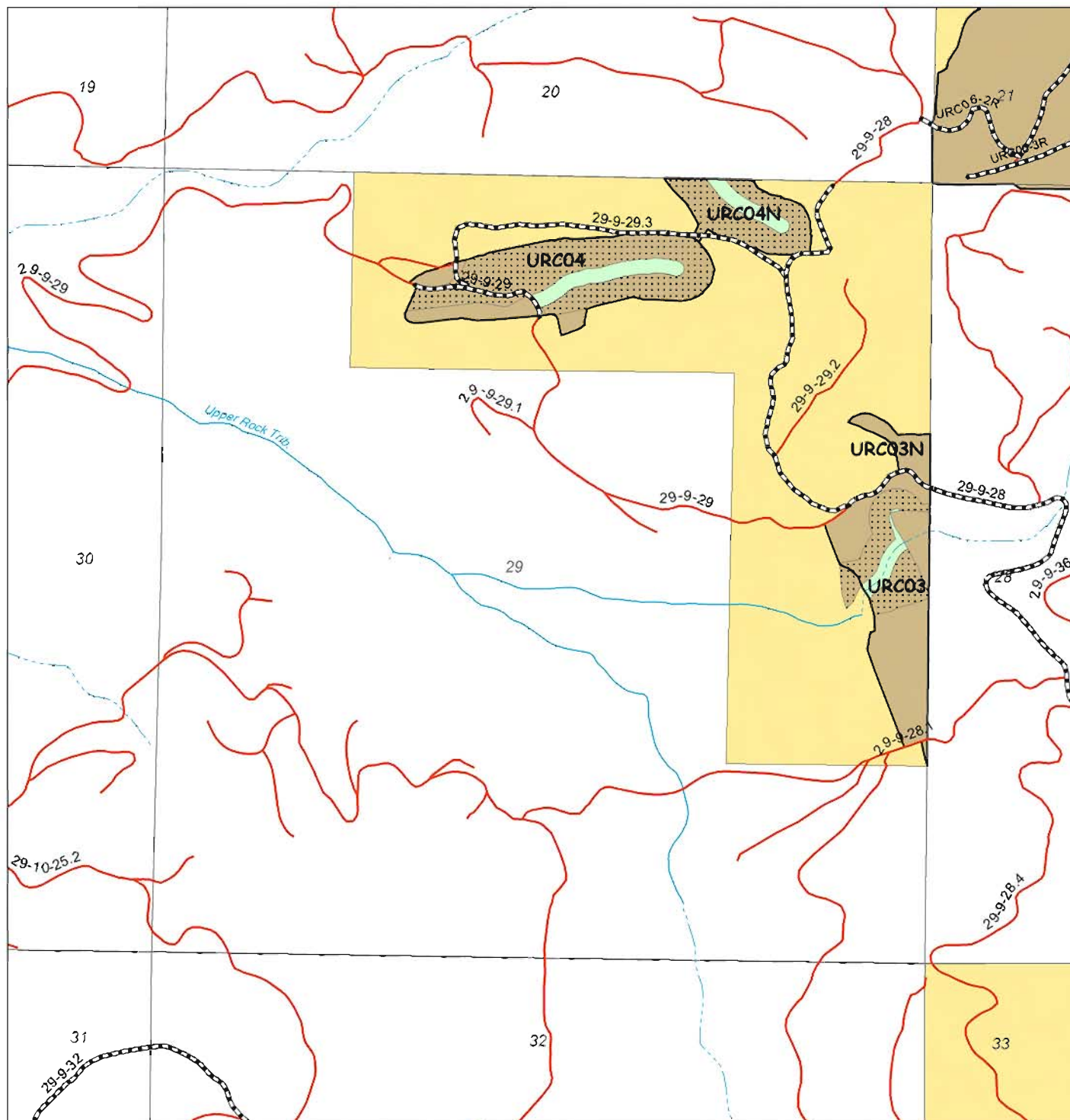


	Highway 42		Commercial Thinning Area
	Road Improvement		No-Harvest Buffer
	New Road Construction		Density Mgmt Area w/ Gaps
	Road Renovation		Fishbearing Stream
	All Other Roads		Non-Fishbearing Stream
	BLM District Boundary		BLM Administered Land
			Private/Other Ownership



No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data.

Map 3(b). Unit Treatments and Road Work - Slater Rocks EA

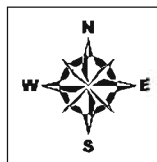


T29S-R09W-Sec 29

Map Features

(Not all map features necessarily occur in the area mapped above.)

- | | |
|-----------------------|---------------------------|
| Highway 42 | Commercial Thinning Area |
| Road Improvement | No-Harvest Buffer |
| New Road Construction | Density Mgmt Area w/ Gaps |
| Road Renovation | Fishbearing Stream |
| All Other Roads | Non-Fishbearing Stream |
| BLM District Boundary | BLM Administered Land |
| | Private/Other Ownership |



US DEPARTMENT OF THE INTERIOR Bureau of Land Management

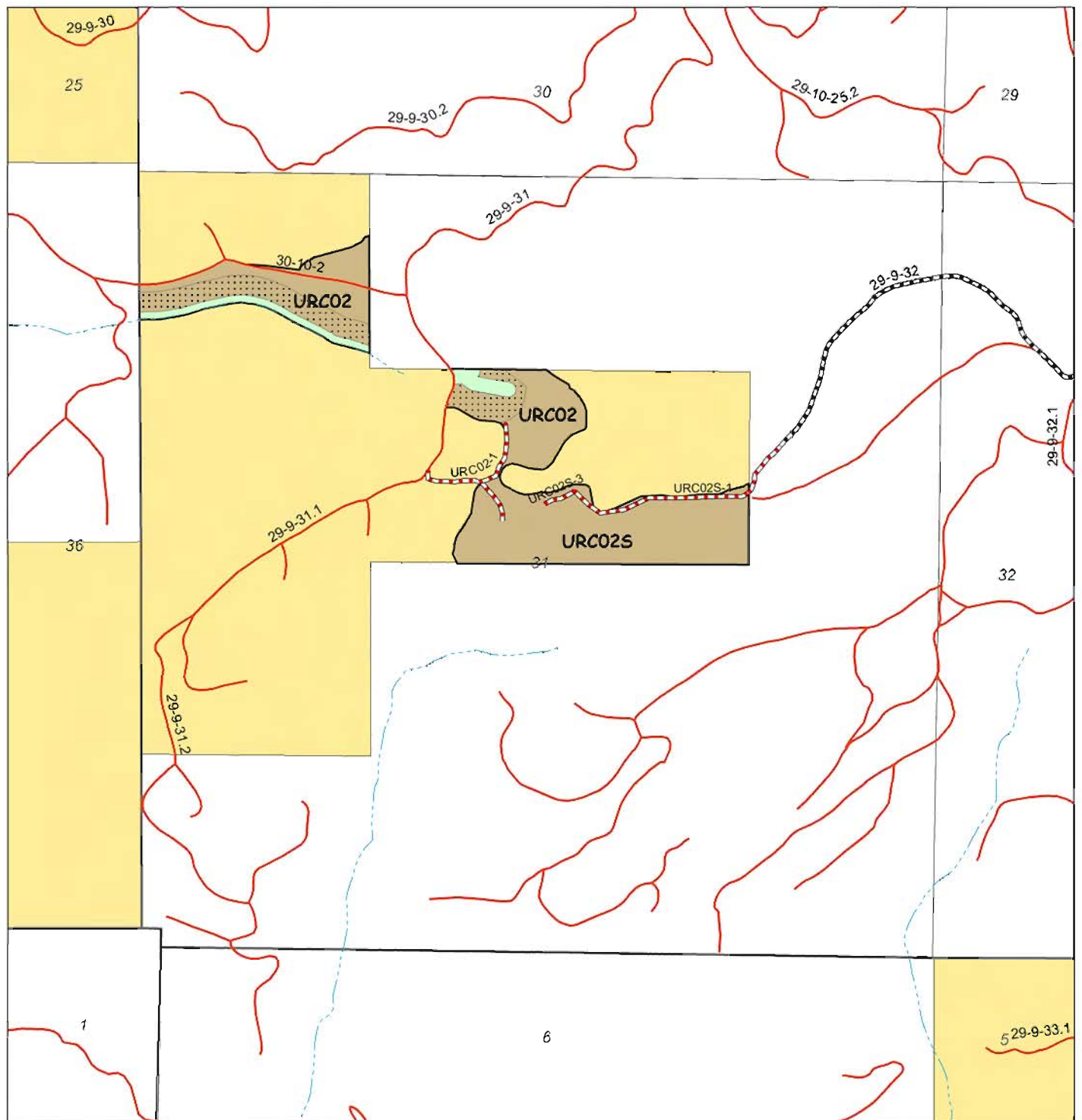
Coos Bay District Office
Myrtlewood Resource Area

Scale = 1:12,000

0 750 1,500
Feet

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data.

Map 3(c). Unit Treatments and Road Work - Slater Rocks EA

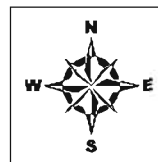


T29S-R09W-Sec 31

Map Features

(Not all map features necessarily occur in the area mapped above.)

- | | |
|-----------------------|---------------------------|
| Highway 42 | Commercial Thinning Area |
| Road Improvement | No-Harvest Buffer |
| New Road Construction | Density Mgmt Area w/ Gaps |
| Road Renovation | Fishbearing Stream |
| All Other Roads | Non-Fishbearing Stream |
| BLM District Boundary | BLM Administered Land |
| | Private/Other Ownership |



US DEPARTMENT OF THE INTERIOR
Bureau of Land Management

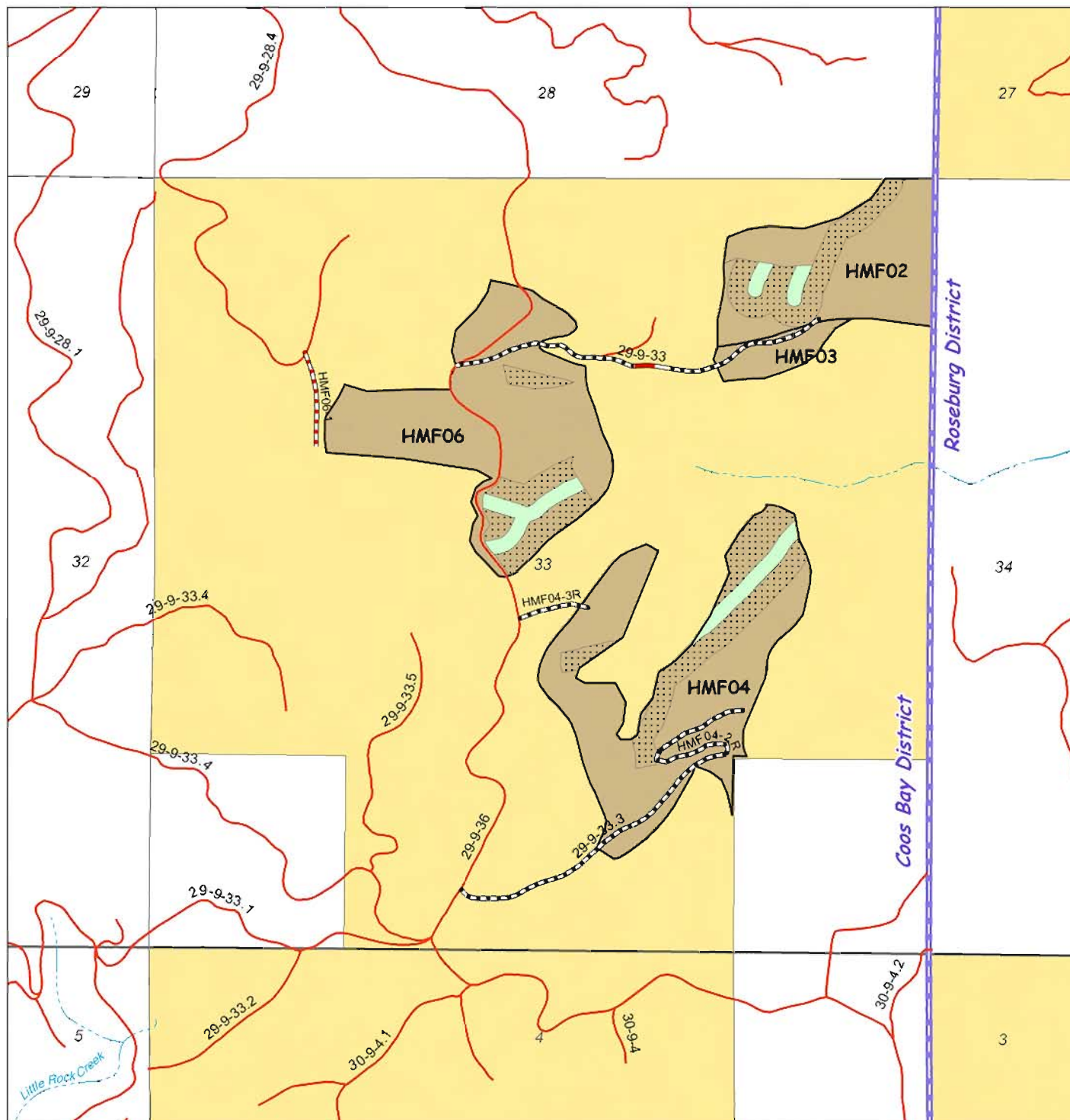
Coos Bay District Office
Myrtlewood Resource Area

Scale = 1:12,000

0 750 1,500
Feet

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data.

Map 3(d). Unit Treatments and Road Work - Slater Rocks EA

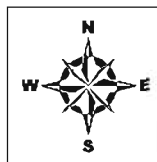


T29S-R09W-Sec 33

Map Features

(Not all map features necessarily occur in the area mapped above.)

- | | |
|-----------------------|---------------------------|
| Highway 42 | Commercial Thinning Area |
| Road Improvement | No-Harvest Buffer |
| New Road Construction | Density Mgmt Area w/ Gaps |
| Road Renovation | Fishbearing Stream |
| All Other Roads | Non-Fishbearing Stream |
| BLM District Boundary | BLM Administered Land |
| | Private/Other Ownership |



US DEPARTMENT OF THE INTERIOR
Bureau of Land Management

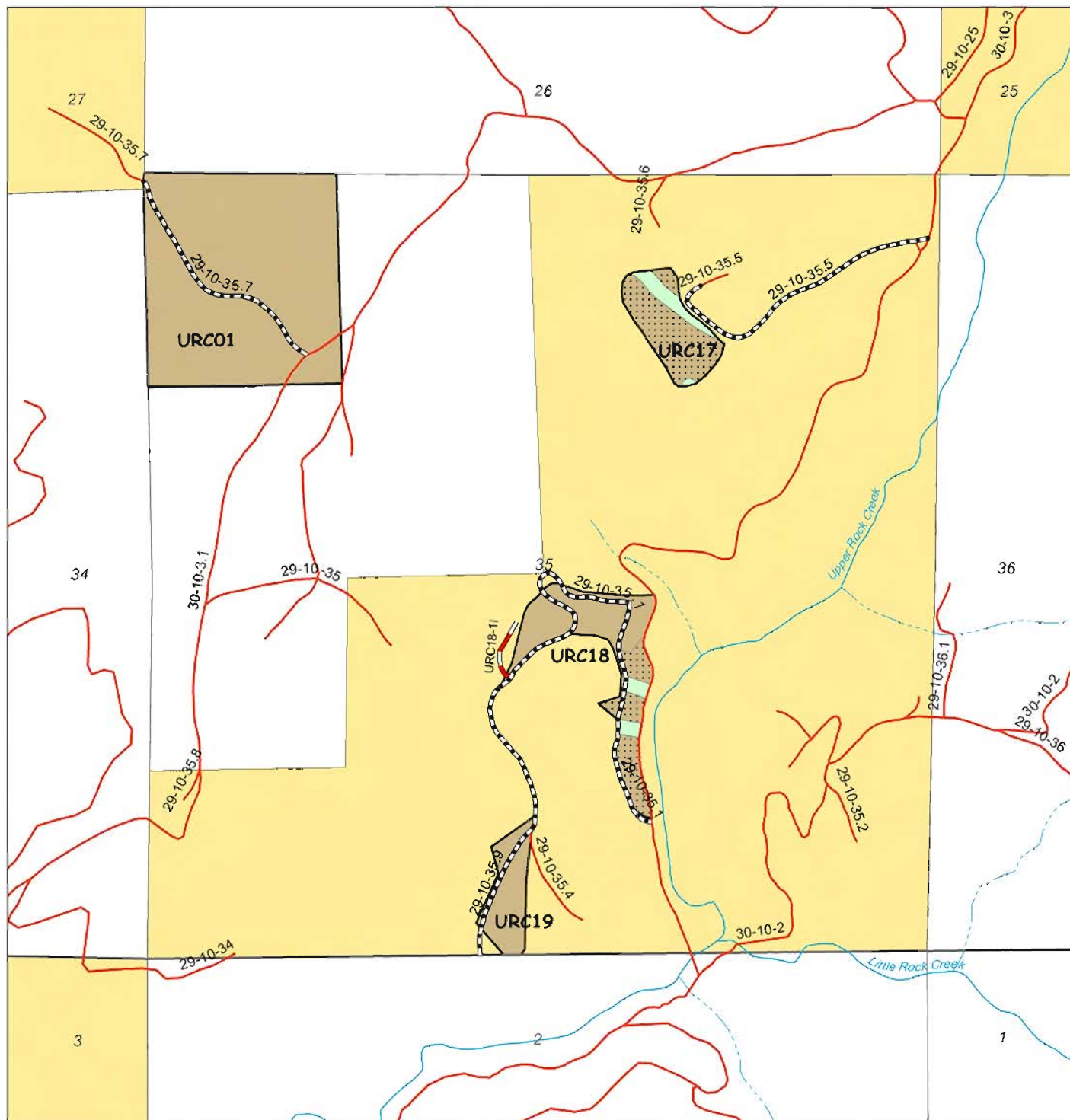
Coos Bay District Office
Myrtlewood Resource Area

Scale = 1:12,000



No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data.

Map 3(e). Unit Treatments and Road Work - Slater Rocks EA

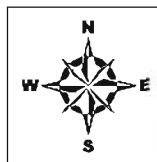


T29S-R10W-Sec 35

Map Features

(Not all map features necessarily occur in the area mapped above.)

- | | |
|-----------------------|---------------------------|
| Highway 42 | Commercial Thinning Area |
| Road Improvement | No-Harvest Buffer |
| New Road Construction | Density Mgmt Area w/ Gaps |
| Road Renovation | Fishbearing Stream |
| All Other Roads | Non-Fishbearing Stream |
| BLM District Boundary | BLM Administered Land |
| | Private/Other Ownership |



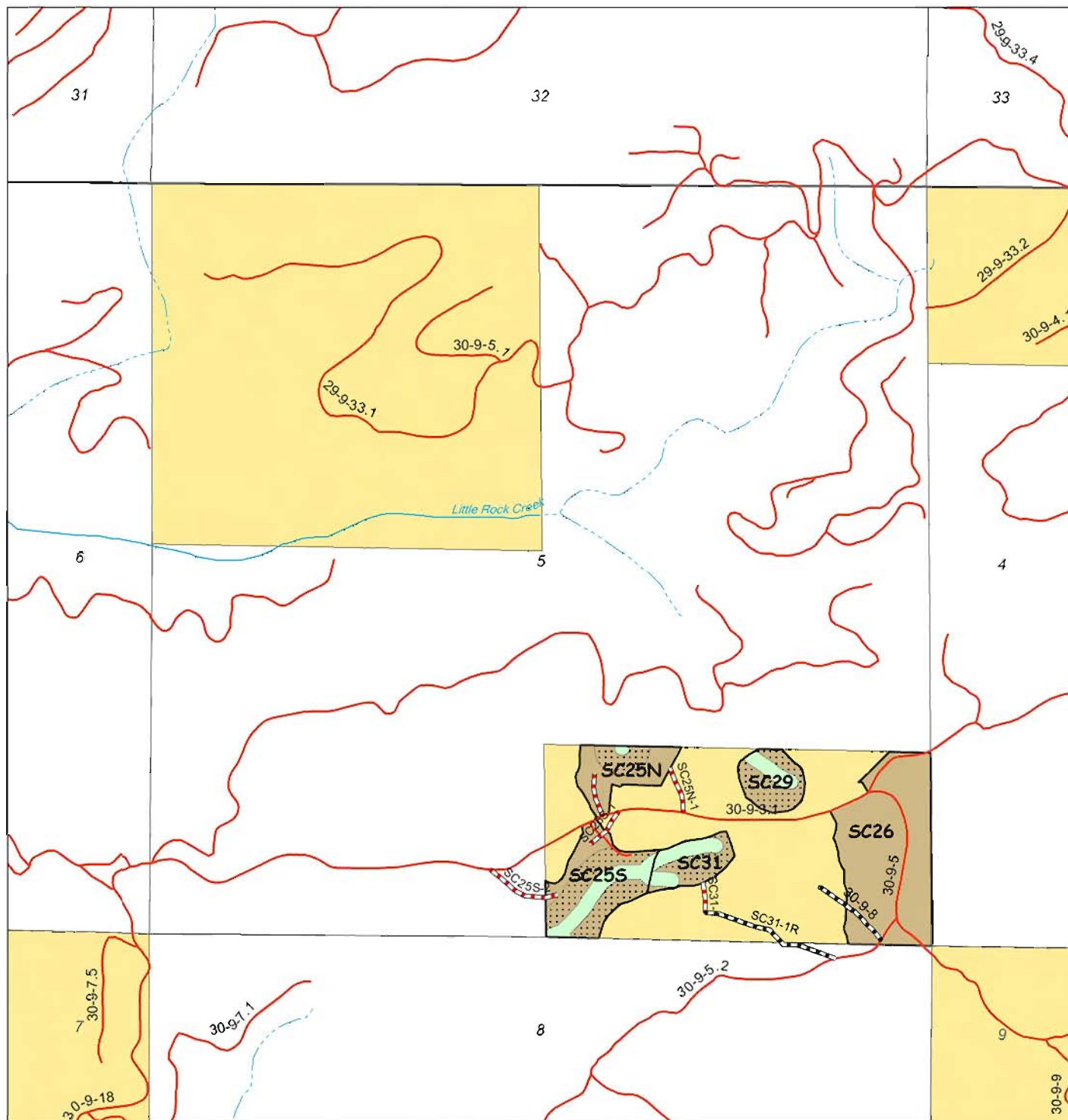
US DEPARTMENT OF THE INTERIOR
Bureau of Land Management

Coos Bay District Office
Myrtlewood Resource Area

Scale = 1:12,000

0 750 1,500
Feet

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data.

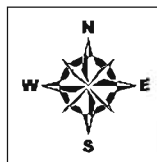


T30S-R09W-Sec 05

Map Features

(Not all map features necessarily occur in the area mapped above.)

- | | |
|-----------------------|---------------------------|
| Highway 42 | Commercial Thinning Area |
| Road Improvement | No-Harvest Buffer |
| New Road Construction | Density Mgmt Area w/ Gaps |
| Road Renovation | Fishbearing Stream |
| All Other Roads | Non-Fishbearing Stream |
| BLM District Boundary | BLM Administered Land |
| | Private/Other Ownership |



US DEPARTMENT OF THE INTERIOR
Bureau of Land Management

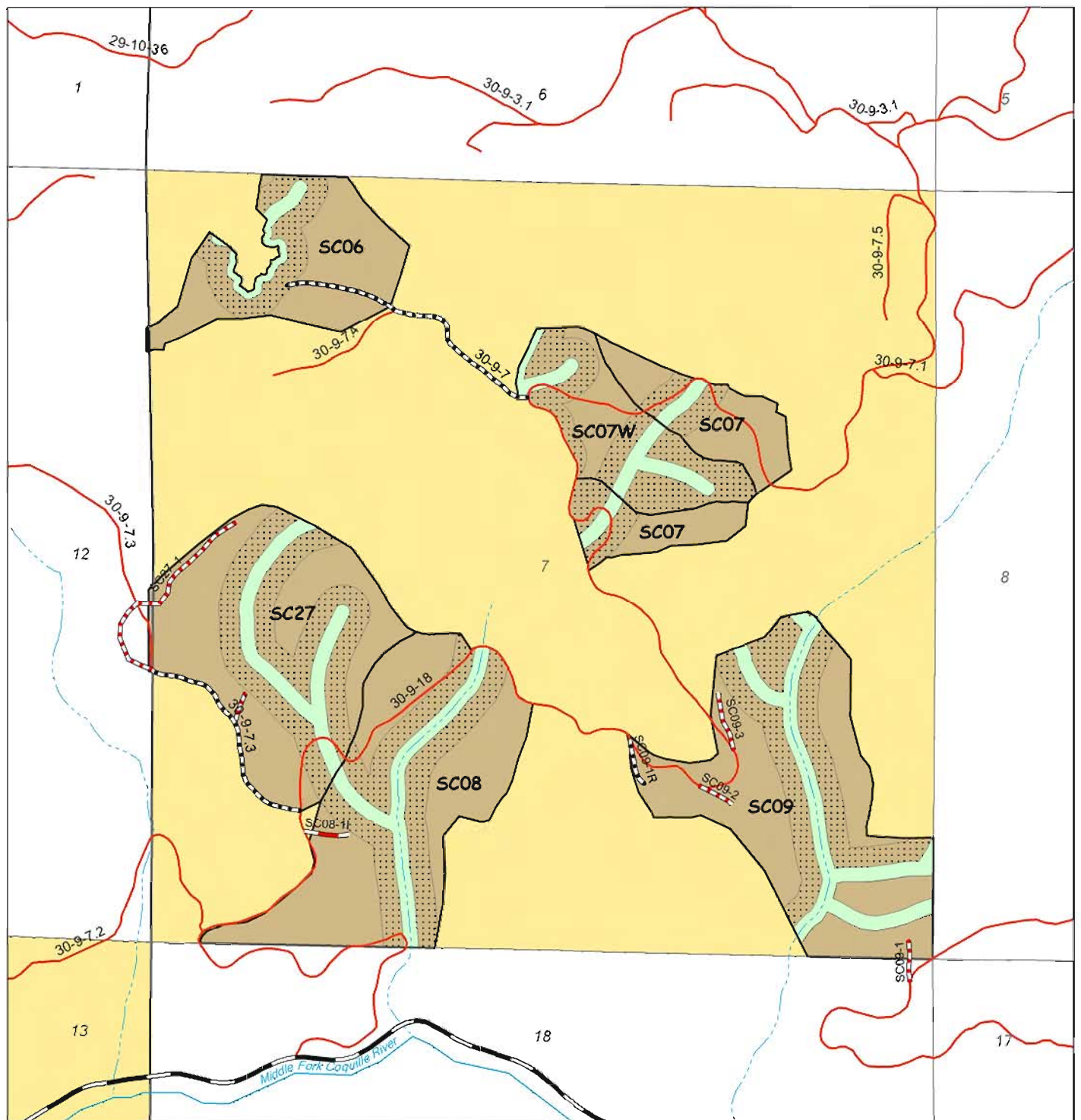
Coos Bay District Office
Myrtlewood Resource Area

Scale = 1:12,000

0 750 1,500
Feet

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data.

Map 3(g). Unit Treatments and Road Work - Slater Rocks EA

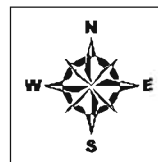


T30S-R09W-Sec 07

Map Features

(Not all map features necessarily occur in the area mapped above.)

- | | |
|-----------------------|---------------------------|
| Highway 42 | Commercial Thinning Area |
| Road Improvement | No-Harvest Buffer |
| New Road Construction | Density Mgmt Area w/ Gaps |
| Road Renovation | Fishbearing Stream |
| All Other Roads | Non-Fishbearing Stream |
| BLM District Boundary | BLM Administered Land |
| | Private/Other Ownership |



US DEPARTMENT OF THE INTERIOR
Bureau of Land Management

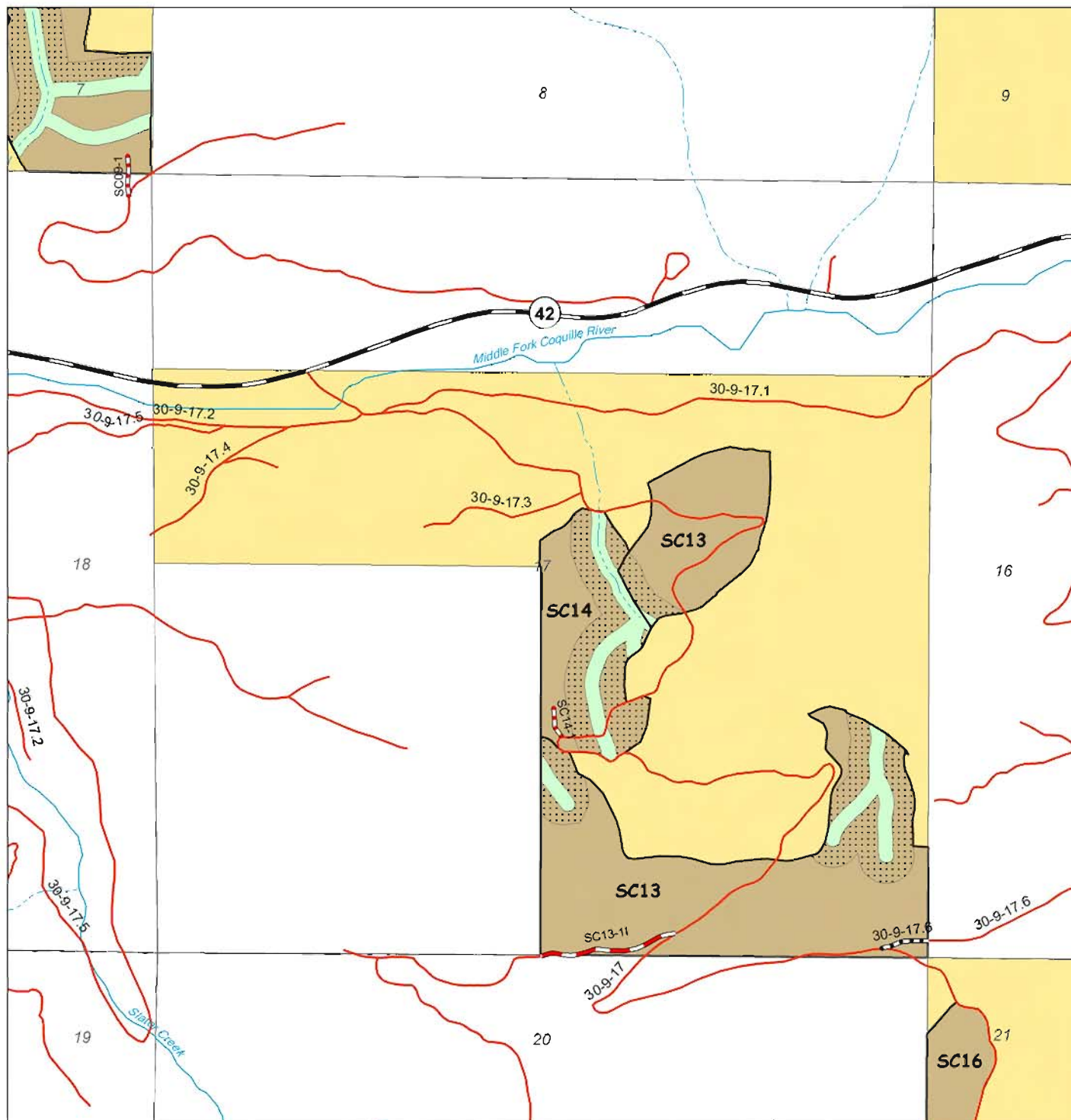
Coos Bay District Office
Myrtlewood Resource Area

Scale = 1:12,000



No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data.

Map 3(h). Unit Treatments and Road Work - Slater Rocks EA

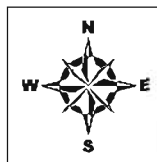


T30S-R09W-Sec 17

Map Features

(Not all map features necessarily occur in the area mapped above.)

- | | |
|-----------------------|---------------------------|
| Highway 42 | Commercial Thinning Area |
| Road Improvement | No-Harvest Buffer |
| New Road Construction | Density Mgmt Area w/ Gaps |
| Road Renovation | Fishbearing Stream |
| All Other Roads | Non-Fishbearing Stream |
| BLM District Boundary | BLM Administered Land |
| | Private/Other Ownership |



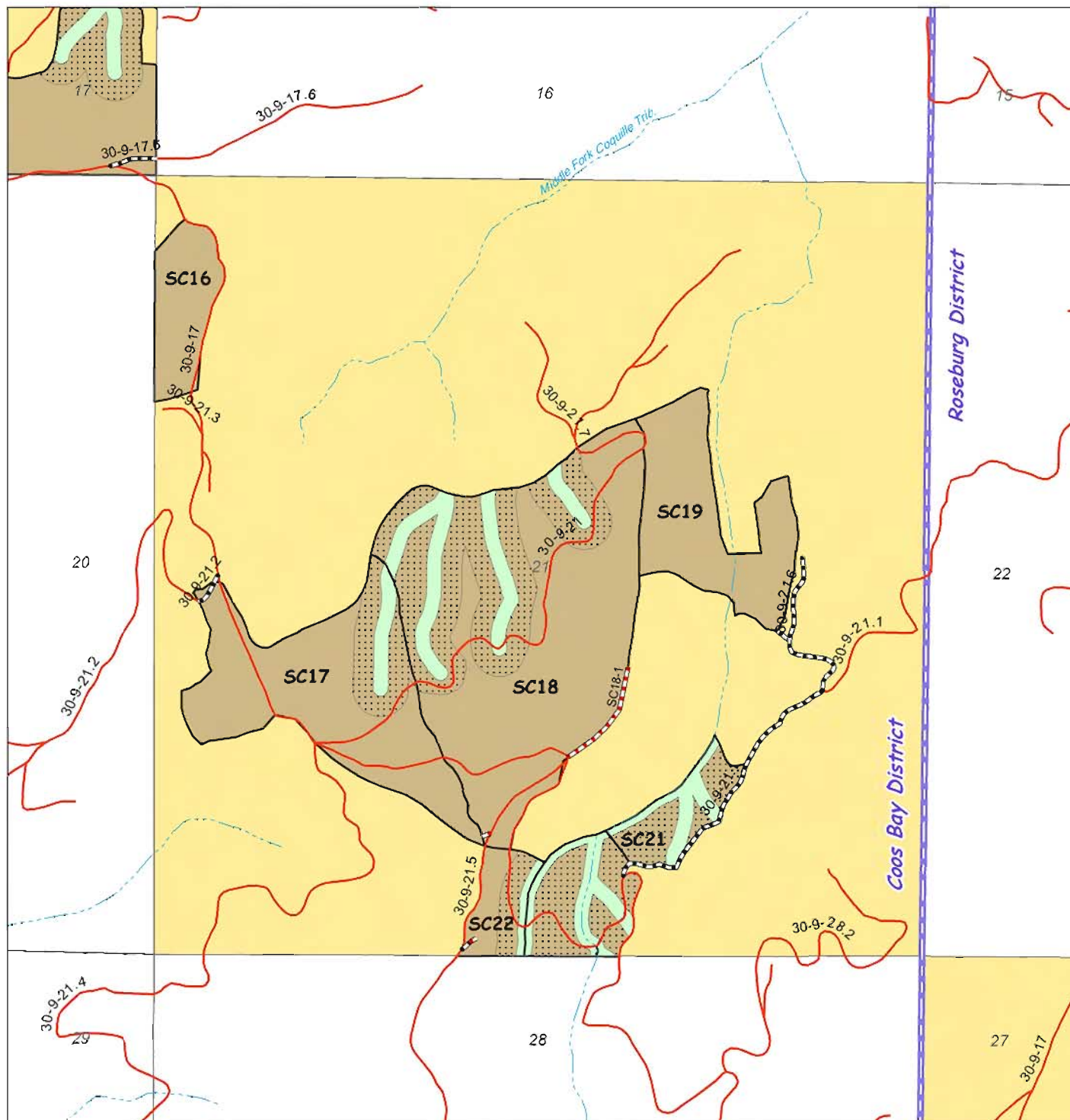
US DEPARTMENT OF THE INTERIOR
Bureau of Land Management

Coos Bay District Office
Myrtlewood Resource Area

Scale = 1:12,000

0 750 1,500
Feet

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data.

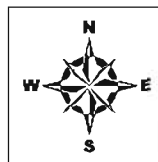


T30S-R09W-Sec 21

Map Features

(Not all map features necessarily occur in the area mapped above.)

- | | |
|-----------------------|---------------------------|
| Highway 42 | Commercial Thinning Area |
| Road Improvement | No-Harvest Buffer |
| New Road Construction | Density Mgmt Area w/ Gaps |
| Road Renovation | Fishbearing Stream |
| All Other Roads | Non-Fishbearing Stream |
| BLM District Boundary | BLM Administered Land |
| | Private/Other Ownership |



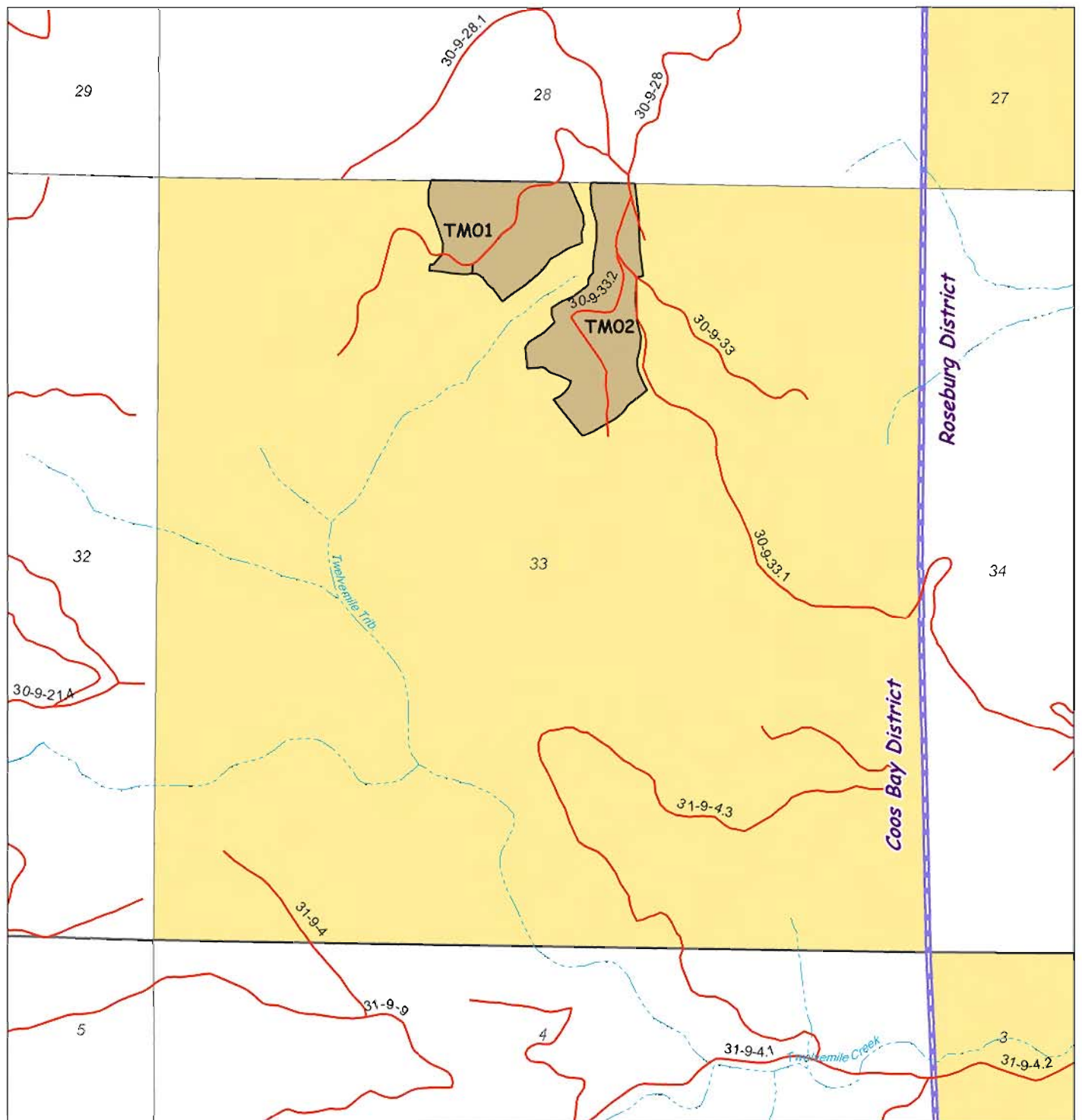
US DEPARTMENT OF THE INTERIOR
Bureau of Land Management

Coos Bay District Office
Myrtlewood Resource Area

Scale = 1:12,000



No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data.

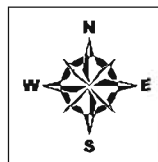


T30S-R09W-Sec 33

Map Features

(Not all map features necessarily occur in the area mapped above.)

- | | |
|-----------------------|---------------------------|
| Highway 42 | Commercial Thinning Area |
| Road Improvement | No-Harvest Buffer |
| New Road Construction | Density Mgmt Area w/ Gaps |
| Road Renovation | Fishbearing Stream |
| All Other Roads | Non-Fishbearing Stream |
| BLM District Boundary | BLM Administered Land |
| | Private/Other Ownership |



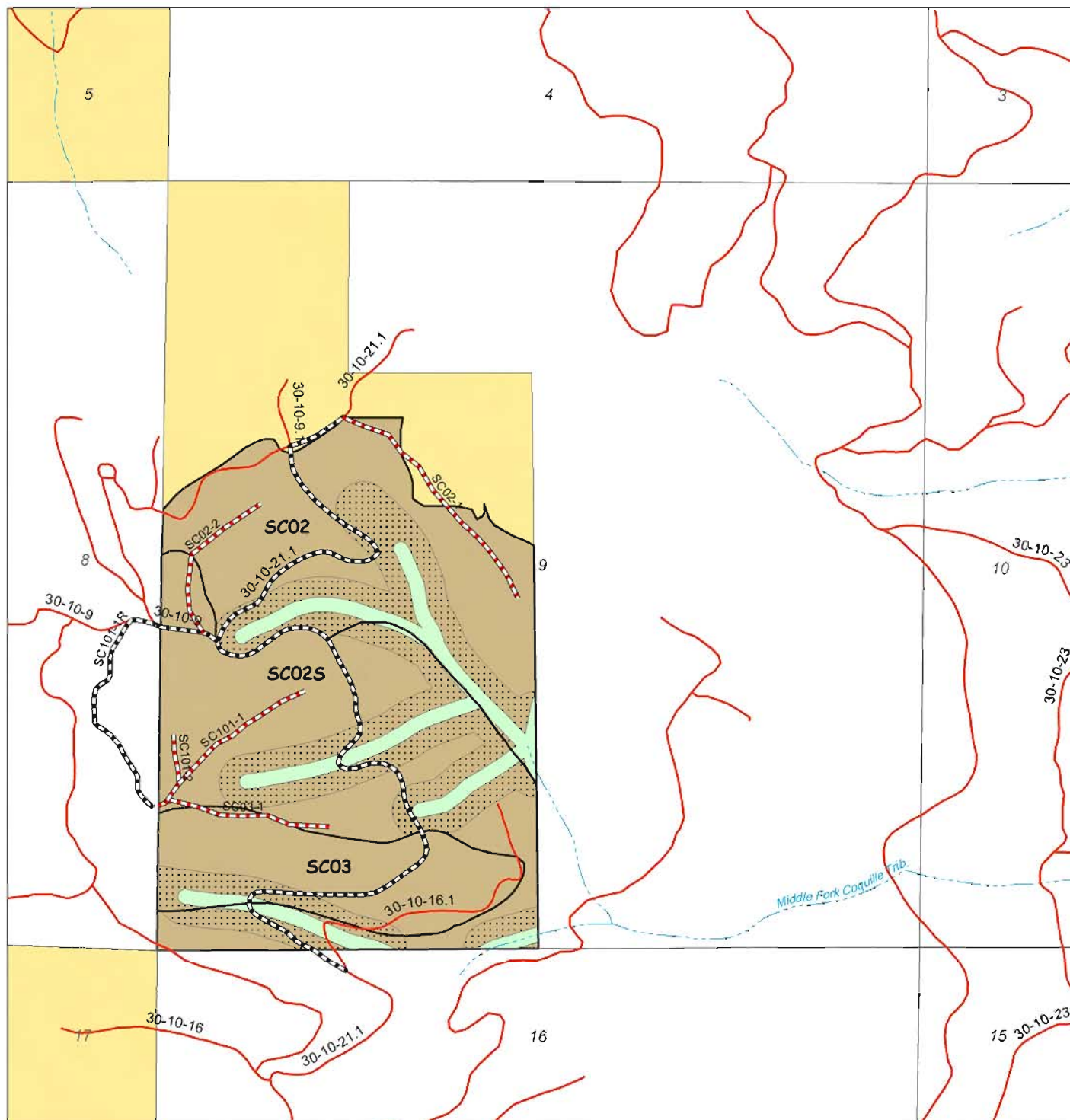
US DEPARTMENT OF THE INTERIOR
Bureau of Land Management

Coos Bay District Office
Myrtlewood Resource Area

Scale = 1:12,000

0 750 1,500
Feet

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data.

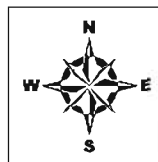


T30S-R10W-Sec 09

Map Features

(Not all map features necessarily occur in the area mapped above.)

- | | |
|-----------------------|---------------------------|
| Highway 42 | Commercial Thinning Area |
| Road Improvement | No-Harvest Buffer |
| New Road Construction | Density Mgmt Area w/ Gaps |
| Road Renovation | Fishbearing Stream |
| All Other Roads | Non-Fishbearing Stream |
| BLM District Boundary | BLM Administered Land |
| | Private/Other Ownership |



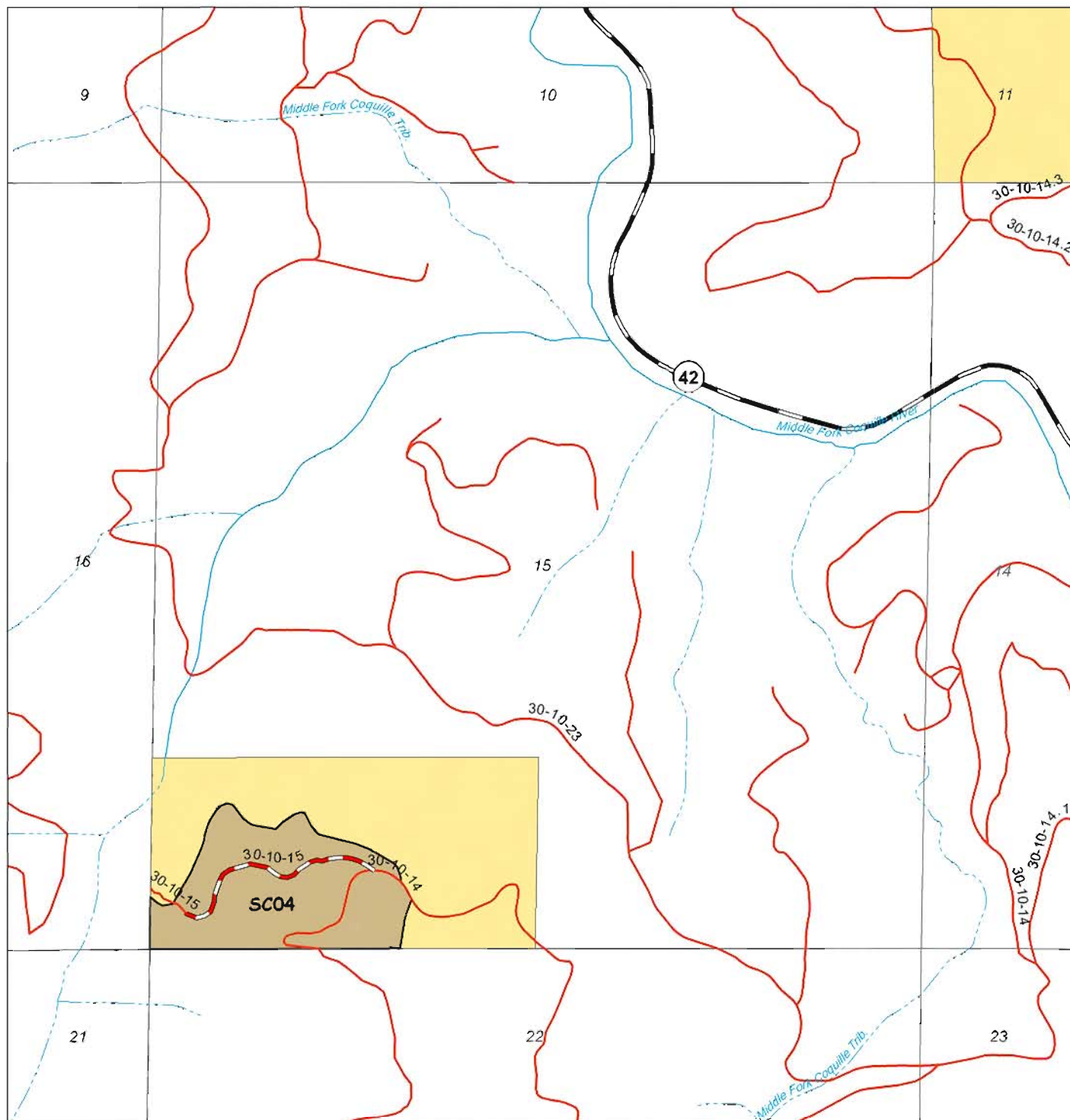
US DEPARTMENT OF THE INTERIOR
Bureau of Land Management

Coos Bay District Office
Myrtlewood Resource Area

Scale = 1:12,000

0 750 1,500
Feet

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data.

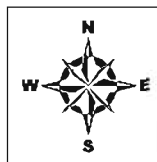


T30S-R10W-Sec 15

Map Features

(Not all map features necessarily occur in the area mapped above.)

- | | |
|-----------------------|---------------------------|
| Highway 42 | Commercial Thinning Area |
| Road Improvement | No-Harvest Buffer |
| New Road Construction | Density Mgmt Area w/ Gaps |
| Road Renovation | Fishbearing Stream |
| All Other Roads | Non-Fishbearing Stream |
| BLM District Boundary | BLM Administered Land |
| | Private/Other Ownership |



US DEPARTMENT OF THE INTERIOR
Bureau of Land Management

Coos Bay District Office
Myrtlewood Resource Area

Scale = 1:12,000



No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data.